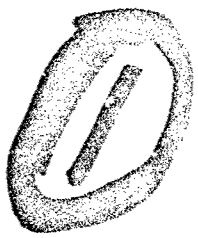


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GENERAL DYNAMICS
Convair Division

A21361 REV 5-65

(1.)

PROPULSION INTERFACE

AIRBORNE

DIFFICULTIES REVIEW

42

GENERAL DYNAMICS
Convair Division

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6
DIFFICULTIES REVIEW ATLAS BOOSTER
AIRBORNE AND GROUND SUPPORT SYSTEMS.

BOOK II.

GENERAL INFORMATION.

Volume XI.

Propulsion Interface Airborne
Difficulties Review.

12 125 p.

CONTRACT/AH04(695)-710

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| Per Htr. on file | |
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Approved by

B. B. Shaffer
B. B. Shaffer

Chief of reliability Engineering

147600

BOOK II - DIFFICULTIES REVIEW - AIRBORNE CONTAINS THE FOLLOWING VOLUMES

| | |
|-------------|---|
| VOLUME I | AIRFRAMES |
| *VOLUME II | ABORT SENSING AND IMPLEMENTATION SYSTEM |
| VOLUME III | AUTOPILOT |
| *VOLUME IV | AUXILIARY POWER SOURCE |
| VOLUME V | ELECTRICAL |
| *VOLUME VI | GUIDANCE |
| VOLUME VII | HYDRAULICS |
| VOLUME VIII | INSTRUMENTATION |
| VOLUME IX | PNEUMATICS |
| VOLUME X | PROPELLANT UTILIZATION |
| VOLUME XI | PROPULSION INTERFACE |
| VOLUME XII | PROPULSION |
| VOLUME XIII | RANGE SAFETY COMMAND |

*VOLUMES II, IV AND VI UNDER ONE COVER.

GENERAL INFORMATION

The Difficulties Review encompasses problems gathered from the factory, the field, (ETR and WTR) and UTP. The factory difficulties are limited to "selloff" and rerun composite testing.

In the UTP area, the difficulties were excerpted from Central Test Control Reports, Problem Reports, Supplementary History Sheets and Problem Review Reports

Field problems for the Difficulties Review have been limited to captive flights, flight readiness firings, actual countdown dual propellant loading, quad tanking, component reliability testing, and flight acceptance composite tests. Difficulties called out in the search for critical weakness program was not documented.

GSE problems shall be limited to ETR Complex 12, 13, 36A and 36B for the present edition. Hereafter only booster difficulties shall be maintained.

Failure analysis reports cover difficulties from the field and factory and may complement the information above.

The GSE Difficulties Review, Book 1 contains 14 Volumes, one volume for each system under one cover. Each volume is appropriately indexed.

The Airborne Difficulties Review, Book 2 contains 13 volumes. Each volume is under separate cover except Volumes II, IV and VI. Volumes II, IV, and VI are under one cover because of the limited material contained in each volume. All volumes are appropriately indexed.

A guide to facilitate interpretation of data in the Difficulties Review (GSE and Airborne) is part of each book or volume.

DIFFICULTIES REVIEW PROPULSION INTERFACE AIRBORNE

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GENERAL DYNAMICS
Convair Division

Subject: Explanatory Information For Use of Difficulties Review (DR)
Data Tab Runs

This information has been prepared to facilitate use of the DR. It is not intended to describe how the DR was prepared nor the scope of the existing effort.

The Difficulties Review (DR) is presented on a form compatible with automated data processing and printout.

Appearing at the top of the page (outside of blocked-in areas) is the identification of the system and whether it is Airborne or Ground Support Equipment. Appearing with this identification is the date of the document and the page number.

On the right hand side outside of the blocked area, appears the abstract number. An abstract number is assigned to each item of the Difficulty Review to facilitate traceability to the original input document.

Appearing under the major identification are blocks wherein the information on component or system difficulty is identified and explained. Attached are samples of pages coded for reference to the following definitions and explanations:

| <u>CODE</u> | <u>EXPLANATION</u> |
|-------------|---|
| ① | <p>This group of blocks callout <u>system</u>, <u>subsystem</u>, <u>test/report number</u>, <u>failed component name</u>, <u>difficulty (Dif)</u> <u>data source</u>, and <u>GDC part number</u> if applicable. Also called out here is the <u>vehicle number</u>, if applicable, and the <u>date of difficulty</u>.</p> <p>In the same row, the <u>site</u> location, and in case of a flight, captive flight, or countdown, the time will be entered.</p> <p>The block containing PRI and OTH refer to whether or not the failure is <u>primary</u> or a <u>secondary</u> failure. A secondary failure is to be interpreted as caused by another discrepancy.</p> <p>The last block in this row is obvious and requires no further explanation:</p> |
| ② | Refers to a major system of the launch vehicle. |
| ③ | Refers to subsystem of a major vehicle system if applicable, (Booster, sustainer, etc). |

GENERAL DYNAMICS

Convair Division

| <u>CODE</u> | <u>EXPLANATION</u> |
|-------------|--|
| (4) | Is a report number as opposed to type of report, (UTP, Countdown, Flight, FAR, etc.). |
| (5) | Is a type of report, such as a FAR, UTP, FRF, etc. |
| (6) | Refers to a component part by name. |
| (7) | Is a component piece part of the component and referred to by name, (plug, seal, wiring, diode, etc., only where applicable). |
| (8) | Is a GDC part number, if applicable. |
| (9) | Refers to a site or location at time of discrepancy on the component or vehicle system. |
| (10) | Is the vehicle on which discrepancy occurred. Vehicle number listed only if unit was installed on a vehicle at time of discrepancy. |
| (11) | Is the vendor part number, if applicable. |
| (12) | Is the vendor name, if applicable. |
| (13) | Is the failure caused by other component or other system. This item defines the failure as secondary or not secondary. |
| (14) | <p>Refers to the primary failure. If item is labeled <u>no</u>, then item (13) may appear as a <u>yes</u>.</p> <p>Should item (13) appear as a <u>yes</u>, then an abstract will have been written to identify the cause of failure effecting the component referred to in the Difficulty Review, Item 6. It should be noted that a multiple failure may be recorded in these blocks, (yes/yes), or if a failure did not occur, (no/no).</p> |
| (15) | Defines the failure mode, and if identifiable, the cause is called out. A careful review of the failure mode is made to determine effect on system operation and vehicle effort. |

GENERAL DYNAMICS

Convair Division

| <u>CODE</u> | <u>EXPLANATION</u> |
|-------------|--|
| (16) | Defines the system effect. This effect is the result of the failure mode assigned to the component. |
| (17) | Defines the vehicle effect. This effect is a result of the failure mode and the result of the system effect. It should be noted that corrective action may be taken whether or not the failure was confirmed. |
| (18) | Lists the corrective action. Taken by GDC, the vendor, or both. |

GENERAL INVESTIGATIVE
DIVISION

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

| SYSTEM SUL SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI VENDOR NAME | OTH VENDOR PART NO |
|----------------------|---|--------------------------|---------------------------------------|-----------------------|---|-----------------------|
| 1 | 2 | HYDRAULIC-A/B BOOSTER | 7FA3977 HYDRAULIC PUMP | UTP-PET 87-08588-1 | 941820 CONVAIR YES VICKERS NO AA-60884-R-2A | 897092 |
| 3 | 4 | HYDRAULIC-A/B BOOSTER | SLV-AB-10-288P HYDRAULIC PUMP/SEAL | FAR 87-08588-1 | 7108 FACTORY YES VICKERS NO AA-60884-R-2A | 898174 |
| 5 | 6 | HYDRAULIC-A/B BOOSTER | SLV-AB-10-288P HYDRAULIC PUMP/SEAL | FAR 87-08588-1 | 7108 FACTORY YES VICKERS NO AA-60884-R-2A | 898174 |
| 7 | 8 | HYDRAULIC-A/B BOOSTER | SLV-AB-10-288P HYDRAULIC PUMP/SEAL | FAR 87-08588-1 | 7108 FACTORY YES VICKERS NO AA-60884-R-2A | 898174 |
| 15 | 16 | HYDRAULIC-A/B BOOSTER | SLV-AB-10-288P HYDRAULIC PUMP/SEAL | FAR 87-08588-1 | 7108 FACTORY YES VICKERS NO AA-60884-R-2A | 898174 |
| 18 | 19 | HYDRAULIC-A/B BOOSTER | SLV-AB-10-288P HYDRAULIC PUMP/SEAL | FAR 87-08588-1 | 7108 FACTORY YES VICKERS NO AA-60884-R-2A | 898174 |

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GENERAL DYNAMICS
CONVAIR DIVISION

PAGE 0002

15 FEB 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE QIP | SITE TIME QIP | PRI OTH | VENDOR NAME VENDOR PART NO |
|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-BOOSTER HYDRAULIC FILL AND BLEED PERFORMED. | | | | | | |
| HYDRAULIC-A/G BOOSTER | FTAB867/P8-WO-01-QACB | COMPOSITE-FRD/DPL | 1310 830713 | 368 | NO | NO |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. TEST WAS RUN WITHOUT BOOSTER HYDRAULICS BECAUSE BOOSTER NPV COULD NOT BE OPERATED REMOTELY. THIS WAS NOTED DURING AUTOPILOT FINAL CHECKS. | | | | | | |
| SYSTEM EFFECT-OPERATION DOES NOT START. | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | |
| CORRECTIVE ACTION-BOOSTER NPV MAND VALVE, MICROSWITCHES VS AND VI ADJUSTED TO MAKE WIPER CONTACT. | | | | | | |
| HYDRAULIC-A/B BOOSTER | GOC/8KFB3-048/01-401-00-39 | FLIGHT | 390 830701 | 8-1 -32.3 | YES NO | |
| FAILURE MODE-LEAK. 91 HYDRAULIC ACCUMULATOR PRESSURE EXHIBITED NO PRESSURE DIFFERENCE DURING THE OIL EVACUATION SEC VEHCE. | | | | | | |
| SYSTEM EFFECT-POSSIBLE CONTAMINATION. ALTHOUGH THE FAILURE MODE INDICATES THE POSSIBILITY OF AIR IN THE BOOSTER HYDRAULIC SYSTEM, SYSTEM PERFORMANCE WAS SATISFACTORY. | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | |
| CORRECTIVE ACTION-NONE. THE POSSIBILITY OF CONTAMINATION WAS NOT CONFIRMED BY ANY OTHER TELEMETRY DATA. | | | | | | |
| HYDRAULIC-A/B BOOSTER | GOC/8KFB3-039/82-401-00-377 | FLIGHT | 1770 830803 | 8-2 2.3 | NO NO | |
| FAILURE MODE-OUT OF TOLERANCE. BOOSTER HYD ACCUM. PRESS MEASUR. M33P AND HYD. PUMP OUTLET PRESS. MEASUR M33P INDICATED AN INITIAL NORMAL PRESS. RISE BUT TO A LOWER (1310 PSIA) THAN NORMAL (3300 PSIA) PEAK AT 2.3 SEC. THE PRESS. THEN DECAYED TO 8720 PSIA DURING NEXT 1.3 SEC. SPECIFIC CAUSE UNKNOWN BUT SYMPTOMATIC OF UNUSUALLY HEAVY DEMAND ON SYSTEM. | | | | | | |
| SYSTEM EFFECT-OPERATION TOO LOW. BOOSTER HYDRAULIC PRESS. LOWER THAN NORMAL FOR A TIME PERIOD OF -2.3 SEC TO 1.8 SEC C. NO ADVERSE EFFECT NOTED ON SYSTEM PERFORMANCE. | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |
| HYDRAULIC-A/B BOOSTER | GOC/C22M83-015-8A1047-/14-7MO-01-71 | COMPOSITE-FRD/DPL | 7107 830419 | 8-4 | YES NO | |

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W

GENERAL DYNAMICS
NAVION DIVISION

DIFFICULTIES REVIEW-PROPUSSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO |
|---|---|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | LY-98-08-3006P V/E PURGE LINE FLARE | FAR 27-20900-309 | 2880 841030 | 18/ETR | YES NO | 64362 |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR A SEVERED TUBING FLARE, THE RESULT OF OVER-TORQUING THE ASSOCIATED 8-INUT | | | | | | |
| CORRECTIVE ACTION-APPROPRIATE PERSONNEL WERE MADE AWARE OF PROBLEM. | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | 69A1841.2 VERNIER PURGE CHECK VALVE | UTP-PRT 27-02111-1 | 640128 | FACTORY | YES NO | 803602 |
| FAILURE MODE-OUT OF TOLERANCE. DURING INITIAL PRT SATISFACTORY PROOF CYCLE THE FULL FLOW PRESSURE DROP WITH SAME INLET PRESSURE AT 265 PSIA AND AMBIENT TEMPERATURE WAS 79 PSID FOR A 40 SCFM FLOW AND 86 PSID FOR A 50 SCFM FLOW. ALLOWABLE PRESSURE DROP IS 75 PLUS OR MINUS 1 PSID AT 45 MINUS 5 SCFM. REF 8/M 010-0085 T.M. NO. 1 | | | | | | |
| CORRECTIVE ACTION-NONE. REF RFTN NR P-418397 AND PRR NO PR634-2-143. | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | 69A1841 VERNIER PURGE CHECK VALVE | UTP-SLT 27-02111-1 | 630315 | FACTORY | YES NO | 803602 |
| FAILURE MODE-LEAK. THE VALVE HAS A CONSTANT INTERNAL LEAKAGE OF 4 CC/MINUTE, ALLOWABLE LEAKAGE IS ZERO. REF 8/M 201-3226 T.M. NO 8. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | 69A1841 VERNIER PURGE CHECK VALVE | UTP-PRT 27-02111-1 | 630425 | FACTORY | YES NO | 803602 |
| FAILURE MODE-OUT OF TOLERANCE. WITH THE INLET PRESSURIZED TO 285 PSIA AND WITH A 75 PLUS OR MINUS 0.5 PSID DROP ACR OSS THE SPECIMEN THE FLOW WAS 18 PLUS OR MINUS 0.5 SCFM GME. REQUIRED FLOW IS 49 PLUS OR MINUS 5 SCFM. REF 8/M 201-0326 T.M. NO 1. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |

15 JUN 1966

GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VEHICLE NAME VENDOR PART NO | |
|---|--|--------------------------------|---------------------|------------------|------------|--------------------------------|--------|
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | SP-90-J8-3131F SUSTAINER LUBE FLEX HOSE BELLOWS | FAR 27-08218-15 | 1180 830411 | WTR-2 | YES NO | FLEX METAL HOSE E | 897809 |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR EXTERNAL LEAKAGE DUE TO CRACKS IN THE BELLOWS CONVOLUTIONS. THE CRACKS ORIGINATED AT THE BRAZED JOINT WHICH CREATED A STRESS CONCENTRATION, AND WITH FLEXING, FATIGUED THE MATERIAL. | | | | | | | |
| CORRECTIVE ACTION-INSTALLATIONS IN PRODUCTION WERE CHECKED, VENDOR CHANGED THE DESIGN, ONLY REDESIGNED HOSES TO BE INSTALLED ON D SERIES VEHICLES. | | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | SP-98-08-197C V/E PURGE CHECK VALVE | FAR 27-02111-1 | 1180 830125 | 38A/ETR | YES NO | MAROTTA | 898214 |
| FAILURE MODE-LEAK, UNIT REJECTED FOR INTERNAL LEAKAGE. NO FAILURE ANALYSIS PERFORMED SINCE PART WAS NOT RECEIVED IN SAN DIEGO. | | | | | | | |
| CORRECTIVE ACTION-NONE. NO FAILURE ANALYSIS PERFORMED. | | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | A-90-08-169 V/E PURGE CHECK VALVE | FAR 27-02111-1 | 1370 821024 | WTR | YES NO | MAROTTA | 898216 |
| FAILURE MODE-LEAK. UNIT REJECTED FOR INTERNAL LEAKAGE DURING REVERSE FLOW TEST. FAILURE CONFIRMED AND CAUSED BY A DROOF OF PINK TORQUE PAINT LODGED BETWEEN THE POPPET AND SEAT. | | | | | | | |
| CORRECTIVE ACTION-FACTORY INSPECTION AND SUPERVISION ADVISED AND CAUTIONED ON USE OF CARE IN APPLICATION OF TORQUE PAINT. | | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | SP-90-08-120 CHECK VALVE, SEAL | FAR 27-02111-1 | 1180 820410 | WTR | YES NO | MAROTTA | 898490 |
| FAILURE MODE-LEAK. UNIT REJECTED FOR LEAKAGE IN THE REVERSE FLOW DIRECTION. FAILURE WAS ATTRIBUTED TO MINUTE PLASTIC CONTAMINATES LODGING BETWEEN THE POPPET AND VALVE SEAT. 4 IDENTICAL CASES REPORTED ON FAR SP-9 -08-220P, -221P, -281P, -3008P. | | | | | | | |
| CORRECTIVE ACTION-ALLOWABLE LEAKAGE RATES WERE REVISED ON DMS. 27-08111 PER CIC 87037. | | | | | | | |

DIFFICULTIES REVIEW-PROPUSSION INTERFACE SYSTEM-AIRBORNE

| SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTM | VENDOR NAME VENDOR PART NO |
|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | SP-90-06-126 CHECK VALVE SEAL-V/E PURGE | FAR 27-02111-1 | 119D 620404 | WTR | YES NO | MAROTTA |
| FAILURE MODE-INTERNAL LEAKAGE IN THE REVERSE FLOW DIRECTION. COULD NOT BE CONFIRMED IN FAILURE ANALYSIS. EXTERNAL LEAKAGE WAS EVIDENT AT THE VALVE BODY PARTING SURFACE. WHEN THE JOINT WAS TIGHTENED THE LEAK STOPPED. 3 IDENTICAL CASES REPORTED ON FAR 90-06-146, -204, -234P. | | | | | | |
| CORRECTIVE ACTION-VENDOR INCORPORATED A TEFLON SEAL BETWEEN THE BODY HALVES. | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | SB-90-06-136 V/E PURGE LINE B-NUT | FAR 27-20900-239 | 620319 | ETR36 | YES NO | GO/C |
| FAILURE MODE-LEAK-EXTERNAL-UNIT REJECTED FOR EXTERNAL LEAKAGE AT A B NUT. FAILURE CONFIRMED AND ATTRIBUTED TO A CRACKED B NUT CAUSE BY OVERTIGHTENING AT INSTALLATION. | | | | | | |
| CORRECTIVE ACTION-GO/C INSPECTION TO FOLLOW TORQUE VALUES IN MFS 24-19. | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | MC-90-06-111 CHECK VALVE SEAL-V/E ENGINE PURGE | FAR 27-02111-1 | 109D 620110 | ETR | YES NO | MAROTTA |
| FAILURE MODE- INTERNAL LEAK. ANALYSIS SHOWED PRESENCE OF CONTAMINATION WHICH WAS CONSIDERED TO HAVE CAUSED THE LEAK AGE. IT IS BELIEVED THE CONTAMINATION ORIGINATED IN THE FUEL SYSTEM. 6 IDENTICAL CASES REPORTED ON FAR 90-06-146, -160, -286, -300BP. | | | | | | |
| CORRECTIVE ACTION-ALLOWABLE LEAKAGE RATES WERE REVISED ON DWG. 27-02111 PER CIGR7037. | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | A-90-06-101 VALVE CHECK, V/E PURGE | FAR 27-02111-1 | 1F 611814 | SYC. | YES NO | SOUTHWESTERN |
| FAILURE MODE-INTERNAL LEAK. UNIT REMOVED FOR INTERNAL LEAKAGE, WHICH WAS CONFIRMED AND CAUSED BY METAL PARTICLES IMBEDDED IN THE REL-F POPPET SEAL. THE SLIDING SURFACES OF THE POPPET AND VALVE BODY WERE ALSO GALLED AND PITTED. THE CONTAMINATION WAS SUSPECTED OF ORIGINATING IN THE GROUND PURGE. | | | | | | |
| CORRECTIVE ACTION-ECP 7060 INSTALLED CHECK VALVES IN THE VENT PORT OF THE PURGE BOX SOLENOID VALVE. CHANGE RELEASED 10-6-82. | | | | | | |

GENERAL DYNAMICS
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DIFFICULTIES REVIEW-PROLUSION INTERFAC SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE | SITE TIME | PRI QTH | VENDOR NAME VENDOR PART NO |
|--|---|--------------------------------|-----------------|--------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | HU-98-08-098 VALVE CHECK, V/E PURGE | FAR 27-02111-1 | 93D 811211 | ETR | YES NO | SOUTHWESTERN |
| FAILURE MODE-LEAK-UNIT REMOVED FOR AN INTERNAL LEAK. LEAKAGE CONFIRMED AND CAUSED BY A PARTICLE OF CONTAMINATION LODGED BETWEEN THE POPPET AND SEAT. THE PARTICLE WAS 2700X750 MICRONS IN SIZE. MATERIAL ANALYSIS INDICATES IT CAME FROM THE GROUND PURGE BOX. | | | | | | |
| CORRECTIVE ACTION-GROUND PURGE SYSTEM REVISED BY ADDING CHECK VALVES TO THE VENT PORTS OF THE PURGE BOX SOLENOID VALVES. THIS WAS EFFECTIVE FOR APR 12, 13, 14 AND WTR PACL 1 AND 2. | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | C1-98-08-011F V/E PURGE CHECK VALVE | FAR 27-02111-1 | 104D 811119 | ETR | YES NO | MAROTTA |
| FAILURE MODE-LEAK-UNIT REJECTED FOR INTERNAL LEAKAGE CAUSED BY GALLING OF THE VALVE GUIDE AND CYLINDER AS RESULT OF LACK OF LUBRICATION. ADDITIONAL CASES REPORTED IN FAR C1-98-08-072P, -081P. | | | | | | |
| CORRECTIVE ACTION-VENDOR TO LUBRICATE VALVES WITH DC-11 LUBRICANT. | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | H2-98-08-083 VALVE CHECK, V/E PURGE | FAR 27-02111-1 | 8110EC | ETR | YES NO | SOUTHWESTERN |
| FAILURE MODE-INTERNAL LEAK. LEAK UNIT WAS REPLACED FOR INTERNAL LEAKAGE DURING A REVERSE FLOW LEAK CHECK, CAUSED BY A BROKEN SPRING DUE TO A MATERIAL FLAW. NO LEAKAGE OCCURRED AFTER A NEW SPRING WAS INSTALLED. | | | | | | |
| CORRECTIVE ACTION-VENDOR AGREED TO BRING THE MATERIAL PROBLEM TO THE ATTENTION OF THE SPRING VENDOR. | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | A6-98-08-087 VALVE, CHECK V/E PURGE | FAR 27-02111-1 | 811018 | ETR | YES NO | SOUTHWESTERN |
| FAILURE MODE-LEAK. VALVE WAS REMOVED DUE TO INTERNAL LEAKAGE DURING REVERSE FLOW LEAK CHECK. EXAMINATION REVEALED CONTAMINATION OF THE POPPET SEAT. AFTER CLEANING THE VALVE DID NOT LEAK. CONCLUSION-LEAKAGE DUE TO CONTAMINATION OF UNDETERMINED ORIGIN. | | | | | | |
| CORRECTIVE ACTION-SITE NOTIFIED, RECOMMENDING SYSTEM BE CHECKED FOR CONTAMINATION. THIS WAS DONE. | | | | | | |

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|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | SLV-30-10-204-F CHECK VALVE SCREW, VERNIER ENGINE FUEL PURGE | FAR 27-02111-1 | 43D 600219 | ETR | YES NO | SOUTHWESTERN V A. CORP |
| FAILURE MODE-INTERNAL LEAK- LEAKED IN THE CHECK DIRECTION DUE TO POPPET SEAT RETAINING SCREW BEING LOOSE WHICH DESTROYED THE SEAL BETWEEN THE SEAT AND THE POPPET BODY. | | | | | | |
| CORRECTIVE ACTION-PRIOR TO THIS INCIDENT THE VENDOR HAD INCREASED THE DEPTH OF THE SCREW SLOT TO IMPROVE THE ABILITY TO APPLY ADEQUATE TORQUE TO THE SCREW. | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | 98-08-047 CHECK VALV SCREW, VERNIER ENGINE F LUEL PURGE | FAR 27-02111-1 | 43D 600219 | ETR | YES NO | SOUTHWESTERN V A. CORP |
| FAILURE MODE-INTERNAL LEAK - VALVE LEAKED IN THE CHECK DIRECTION DUE TO POPPET SEAT RETAINING SCREW BEING LOOSE WHICH DESTROYED THE SEAL BETWEEN THE SEAT AND THE POPPET BODY. | | | | | | |
| CORRECTIVE ACTION-PRIOR TO THIS INCIDENT THE VENDOR HAD INCREASED THE DEPTH OF THE SCREW SLOT TO IMPROVE THE ABILITY TO APPLY ADEQUATE TORQUE TO THE SCREW. | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | 88-08-042 CHECK VALVE, VERNIER ENGINE PURGE, POPPET ET | FAR 27-02111-1 | 591202 | SYCAMORE | YES A. | SOUTHWESTERN V CORP |
| FAILURE MODE-CONTAMINATION- ALL VALVES, 3/N 134, 141, 161, 126 AND 204 WERE FOUND TO LEAK DURING CHECK PRIOR TO NORMAL PURGE CHECKOUT. FOUR VALVES WERE FROM SYCAMORE AND TWO FROM AMP. EACH VALVE POPPET SEAT CONTAINED IMBEDDED METAL PARTICLES. CONTAMINATION OCCURS WHEN THE SYSTEM IS OPENED FOR PURGE ORIFICE CALIBRATION OR OTHER REASON. ALL BASES, EXCEPT SYCAMORE, HAVE ABANDONED THE CALIBRATION PROCEDURE. AMP, VALVES FAILED AFTER SYSTEM WAS OPENED FOR ANOTHER REASON. | | | | | | |
| CORRECTIVE ACTION-ALL BASES NOTIFIED OF PROBLEM. BACK FLOW LEAK CHECKS ARE MADE PRIOR TO TANKING ELIMINATING THE POSSIBILITY OF A LEAKY VALVE DUE TO CONTAMINATION | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | 88-08-042 CHECK VALVE SEAL, VERNIER ENGINE P LURGE | FAR 27-02111-1 | 391202 | ETR | YES NO | SOUTHWESTERN V A. CORP |
| FAILURE MODE-CONTAMINATION- ALL VALVES 3/N 134, 141, 161, 126 AND 204 WERE FOUND TO LEAK DURING CHECK PRIOR TO NORMAL PURGE CHECKOUT. FOUR VALVES WERE FROM SYCAMORE AND TWO FROM AMP. EACH VALVE POPPET SEAT CONTAINED IMBEDDED METAL PARTICLES. CONTAMINATION OCCURS WHEN THE SYSTEM IS OPEN FOR PURGE ORIFICE CALIBRATION OR OTHER REASON. ALL BASES, EXCEPT SYCAMORE, HAVE ABANDONED THE CALIBRATION PROCEDURE. AMP VALVES FAIL AFTER SYSTEM WAS OPENED FOR ANOTHER REASON. | | | | | | |

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DIFFICULTIES REVIEW-PROLUSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO |
|--|--|--------------------------------|---------------------|------------------|------------|-------------------------------|
| | CORRECTIVE ACTION-ALL BASES NOTIFIED OF PROBLEM. BACK FLOW LEAK CHECKS ARE MADE PRIOR TO TANKING, ELIMINATING THE POSSIBILITY OF A LEAKY VALVE DUE TO CONTAMINATION. | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | 98-08-041 CHECK VALVE, POPPET, VERNIER PURGE | 27-08111-1 | 240 581118 | SYCAMORE | YES | SOUTHWESTERN V NO A. CORP |
| | FAILURE MODE-INTERNAL LEAK. LEAKAGE CHECK PRIOR TO INSTALLATION ON 240 SHOWED GAS LEAKAGE DUE TO A POROUS PLASTIC POPPET. | | | | | |
| | CORRECTIVE ACTION-PLASTIC POPPETS WERE REPLACED BY STAINLESS STEEL POPPETS HAVING KEL-F SEALS. | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | 90-08-037 PURGE LINE, BOOSTER ENGINE FUEL JA | 27-20900-9 | 60 590819 | WTR | YES | CONVAIR NO |
| | FAILURE MODE-STRUCTURAL-1/2 INCH ALUMINUM TUBING BURST WHILE USED WITH WATER INSTEAD OF LITHIUM CHLORIDE. BURSTING CAUSED BY WATER FREEZING, AND CONSEQUENT EXPANSION, DUE TO PROXIMITY TO LOW TEMP. FROM SUBCOOLING THE HELIUM BOTTLES WITH LN2 OR LOX IN THE ENGINE DUCTS. | | | | | |
| | CORRECTIVE ACTION-ADD AND ON WILL NOT CONTAIN THIS SECTION OF TUBING, BY DELETION OF THE INERT FLUID FILL REQUIREMENT. TESTS CONDUCTED TO DETERMINE INTERIM ACTION PRIOR TO ADD. | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | 0A48/B1-48H-02-06 | COMPOSITE-FRD/DPL | 60 590702 | 570-A-2 | NO | NO |
| | FAILURE MODE-FAILED TO CEASE OPERATION AT PRESCRIBED TIME. RECEIVED CONTINUOUS PURGE TO ENGINES BECAUSE OF PURGE SYSTEM FAILURE. | | | | | |
| | SYSTEM EFFECT-NONE. | | | | | |
| | VEHICLE EFFECT-NONE. | | | | | |
| | CORRECTIVE ACTION-UNKNOWN. | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | 98-08-028 CHECK VALVE SCREW | 27-08111-1 | 590507 | SYCAMORE | YES | SOUTHWESTERN V NO A. CORP |
| | FAILURE MODE-INTERNAL LEAK- VALVES 8/N 170, 159, 103 AND 102 REJECTED FOR LEAKAGE. 8/N 170 AND 159 LEAKED BECAUSE OF INTERFERENCE OF A ROUND HEAD SCREW AND THE POPPET SEAT. 8/N 108 AND 103 LEAKED BECAUSE OF POROSITY OF PLASTIC POPPET BODY. | | | | | |

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| | | | | | | | 000001 |
| | CORRECTIVE ACTION-RECOMMENDED REDESIGN TO ELIMINATE INTERFERENCE OF SCREW HEAD AND POPPET SEAT, AND DISCONTINUE USE OF PLASTIC BODY POPPET. ACTION WAS INITIATED BY CONVAIR TO REJECT ALL SUCH ABOVE VALVES AND REPLACE THEM WITH VALVE S INCORPORATING RECOMMENDED CHANGES, PLASTIC POPPETS REPLACED BY STAINLESS STEEL POPPETS HAVING REL-F SEALS. | | | | | | |
| PROPULSION INTERFACE-A/B LUBE OIL/PURGE | EN-771/31-102-A2-09 PURGE SOLENOID VALVE | CAPTIVE | 9A 371121 | 8-1/8YC | YES NO | | 000031 |
| | FAILURE MODE-LEAK-EXTERNAL. FUEL LEAK FROM VENT PORT OF VERNIER ENGINE FUEL PURGE SOLENOID ON THE ENGINE HELIUM PURGE MANIFOLD. SOLENOID VALVE FAILED DUE TO BRONZE CHIP ON VALVE SEAT. CONTAMINATION BELIEVED TO HAVE ORIGINATED FROM THE END OF THE CHAMBER IN THE MANIFOLD. | | | | | | |
| | SYSTEM EFFECT-CONTAMINATION-LOX SIDE OF VERNIER ENGINE WOULD BE CONTAMINATED WITH FUEL IF AN ADORT OCCURRED. AT SEC AND ATTEMPT OF LAUNCH AN EXPLOSION IN VERNIER ENGINE WOULD RESULT. | | | | | | |
| | VEHICLE EFFECT-POSSIBLE FIRE AND LOSS OF MISSILE. | | | | | | |
| | CORRECTIVE ACTION-SOLENOID VALVE REPLACED. | | | | | | |
| PROPULSION INTERFACE-A/B PNEUMATIC | 98-06-074 TUBE ASSEMBLY-PROPULSION CONTROL SYSTEM | FAR S 27-20400-123 | 111D 070710 | ETR | YES NO | YES CONVAIR | 000033 |
| | FAILURE MODE-OUT OF TOLERANCE. TUBE WAS CROSS CONNECTED. IT WAS CONNECTED TO THE NORMALLY OPEN PORT INSTEAD OF THE NORMALLY CLOSED PORT OF THE PNEUMATIC MANIFOLD THE DISCREPANCY WAS NOTED AND CORRECTED BEFORE ANY FAILURE OCCURRED. | | | | | | |
| | CORRECTIVE ACTION-ALL D VEHICLES IN FINAL ASSEMBLY AND CHECKOUT WERE INSPECTED FOR CONFORMANCE TO BLUE PRINT COMP16 URATION. CHIP AND INSPECTION PERSONNEL WERE CAUTIONED AND NOTES ADDED TO PLANNING CARDS. A CRITICISM AND DIFFICULTY S REPORT NO. 9828 WAS FORWARDED TO ENGINEERING REQUESTING A FIX TO ELIMINATE THE POSSIBILITY OF CROSS- CONNECTS. | | | | | | |
| PROPULSION INTERFACE-A/B PNEUMATIC | 60A/AP264-035/A1-401-00-243 VERNIER LOX TANK PRESS. FITTING | FLIGHT | 2430 040810 | A-1/MTR 137 | YES NO | | 000423 |
| | FAILURE MODE-LEAK EXTERNAL. HELIUM LEAKAGE AT ENGINE LOX TANK PRESSURE ATION FITTING. AT ENGINE TANKS REPRESSURIZAT ION (RECOI), ENGINE LOX TANK PRESSURE ROSE TO PNEUMATIC REGULATOR PRESSURE BUT DID NOT START RISING AGAIN UNTIL 175.2 SECONDS AND DID NOT REACH CHARGE LINE PRESSURE UNTIL 186.5 SECONDS. | | | | | | |
| | SYSTEM EFFECT-NONE. | | | | | | |
| | VEHICLE EFFECT-NONE. | | | | | | |
| | CORRECTIVE ACTION-PRESENT BULKHEADTYPE FITTINGS REPLACED WITH FLANGE TYPE FITTINGS. | | | | | | |

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|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B PNEUMATIC | LV-98-08-273F BOOSTER GAS GENERATOR LINE | FAR 27-22413-3 | 2630 840423 | 12/ETR | YES NO | 60/C |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR DAMAGED TUBING FLARES. THE FLARES CONTAINED DIE MARKS, SCRATCHES AND PIT 3-THE DIE MARKS WERE MADE AT THE TIME THE FLARES WERE FORMED. THE SOURCE OF THE SCRATCHES AND PITS COULD NOT BE DETERMINED. | | | | | | |
| CORRECTIVE ACTION-STOCK WAS PURGED AND PERSONNEL INSTRUCTED TO MAINTAIN CLOSER SURVEILLANCE TO DETECT AND REJECT SUCH CONDITIONS. | | | | | | |
| PROPULSION INTERFACE-A/B PNEUMATIC | SP-90-08-232F LINE | FAR 27-80025-135 | 1900 830808 | FACTORY | YES NO | 60/C |
| FAILURE MODE-LEAK-EXTERNAL-CONTROL BOTTLE LINE REJECTED FOR LEAK AT BULKHEAD FITTING. | | | | | | |
| CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED. | | | | | | |
| PROPULSION INTERFACE-A/B PNEUMATIC | SP-99-08-3124F TUBEASSEMBLY,B-NUT | FAR 27-20400-139 | 630322 | FACTORY | YES NO | |
| FAILURE MODE-FAIL DURING OPERATION. B-NUT CRACKED. WOULD NOT HOLD PRESSURE. CRACK HAD STARTED FROM AN INCLUSION AND HAD PROPAGATED THRU THE WALL THICKNESS. MATERIAL WAS 303 CRES. | | | | | | |
| CORRECTIVE ACTION-MILITARY SPECIFICATION F-5509A AMENDMENT 7 ELIMINATES FURTHER USE OF 303 STAINLESS STEEL FOR AIRB ORNE FLUID CONNECTION FITTINGS, DEC. 1982. | | | | | | |
| PROPULSION INTERFACE-A/B PNEUMATIC | SP-90-08-227F STARTTANKPRESSURIZINGLINE,B-NUT | FAR 27-20203-181 | 1190 830428 | 1-27/PALC | YES NO | 60/C |
| FAILURE MODE-LEAK-EXTERNAL. LEAKAGE OCCURRED AT B-NUT BECAUSE OF LOW TORQUE, ATTRIBUTED TO STRESS RELAXATION DUE TO EFFECTS OF TRANSPORTATION, ABNORMAL TESTING OF VEHICLE, AND/OR IMPROPER TORQUE APPLICATION DURING INSTALLATION. | | | | | | |
| CORRECTIVE ACTION-SITE PERSONNEL RETORQUED B-NUT AND LEAK STOPPED. FACTORY PERSONNEL REQUESTED TO EXERCISE MORE CARE IN TORQUING B-NUTS DURING INSTALLATION. | | | | | | |

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|--|--|--------------------------------|---------------------|------------------|------------|----------------------------------|--------|
| PROPULSION INTERFACE-A/B PNEUMATIC | N2-A9-08-180F HELIUM STAGING DISCONNECT LATCH | FAR 27-20428-7 | 1930 830112 | FACTORY | YES NO | 60/C | 000215 |
| FAILURE MODE-FAIL DURING OPERATION. UNIT REJECTED FOR FAILURE DURING A PRESSURIZATION CHECK. EXAMINATION REVEALED 7 ME LANYARD-PIN SPRING-LINGER WAS NOT SEATED BEHIND THE LOCK-LATCHING BALLS. VARIOUS DIMENSIONAL DISCREPANCIES WERE FOUND IN THE ASSEMBLY TO CAUSE THE PROBLEM. | | | | | | | |
| CORRECTIVE ACTION-ALL OPERATING BASES CAUTIONED TO USE PARTICULAR CARE IN ASCERTAINING THE DISCONNECT IS PROPERLY LOCKED. ALL PARTS IN STOCK WERE CHECKED FOR DRAWING CONFORMANCE AND THE VENDOR OF THE BUSHING AND P14 WERE REQUESTED TO IMPROVE THEIR QC. | | | | | | | |
| PROPULSION INTERFACE-A/B PNEUMATIC | A-A9-08-177F TUBE ASSEMBLY, HELIUM SUPPLY-B NUT | FAR 27-43028-25 | 2500 821204 | FACTORY | YES NO | | 000215 |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR A CRACKED B NUT. FAILURE CONFIRMED. MATERIAL IDENTIFIED AS TYPE 303 STAINLESS STEEL, WHICH WILL NOT WITHSTAND HIGH STRESSES IN TRANSVERSE DIRECTION. | | | | | | | |
| CORRECTIVE ACTION-MIL-F-5509A, ANCD. 7, RELEASED JAN. 1963 WHICH DELETES TYPE 303 STAINLESS STEEL FOR USE IN AIRBORNE B NUTS. | | | | | | | |
| PROPULSION INTERFACE-A/B PNEUMATIC | EW-347/103-1 | CAPT:VE | 3A 570218 | 9-1/8YC | NO NO | | 000502 |
| FAILURE MODE-ERRATIC OPERATION. THE BOOSTER LOX REGULATOR REFERENCE PRESSURE WAS ERRATIC. THIS WAS TRACED TO INSUFFICIENT PNEUMATIC PRESSURE FROM THE GROUND SUPPLY. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 89A3969.3 MOSE ASSY-BUST, START, OXIDIZER 3/ 27-08186-3 | UTP-PRT | 831209 | 60/C | YES | FLEXIBLE METAL HOSE 100710 | |
| FAILURE MODE-LEAK SPECIMEN LEAKED 16 SMALL BUBBLES MIN AT 1000 PSI'S DURING PROOF PRESSURE PORTION OF THE INITIAL ACCEPTANCE TEST LEAKAGE WAS IN APPROX CENTER OF BRAIDED SECTION. REQUIRED PROOF PRESSURE IS 1500 PSIG WITH NO LEAKAGE. REF PARA 9.2 AND 4.7.19. | | | | | | | |
| CORRECTIVE ACTION-VENDOR IS INITIATING 100 PERCENT INSP OF ALL HOSES. 60C WILL SUBJECT ALL 27-08186-3 HOSES TO PAT | | | | | | | |

REVIEW PAGE

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| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PHI OTH | VENDOR NAME VENDOR PART NO | |
|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|------------------|
| PROPULSION INTERFACE-A/B LOX FEED | CT-98-08-133 FILL-AND-DRAIN VALVE/SEAL | FAR 27-02102-829 | 051112 | 36A/ETR | YES NO | AIRESEARCH 121072-1 | 090504 090533 |
| TESTING UNTIL FURTHER NOTICE. ADDITIONAL VENDORS ARE BEING CERTIFIED. | | | | | | | |
| FAILURE MODE-LEAK EXTERNAL. LEAKAGE OF 9.8 SCIM PAST BUTTERFLY SHAFT SEAL OF FILL-AND-DRAIN VALVE NOTED DURING BENCH LEAK TEST. LEAKAGE ATTRIBUTED TO BUTTERFLY SHAFT SURFACE FINISH BEING 45 MICRO- INCHES INSTEAD OF REQUIRED 32 OR 8 MICRO- INCHES. IT WAS FOUND THAT AFTER INITIAL INSTALLATION OF SHAFT SEAL, LEAKAGE WOULD RESULT UNLESS SEAL WAS FIRST MOVED SLIGHTLY UP AND DOWN ON SHAFT TO PUSH SEAL INTO CORRECT SEATING POSITION. | | | | | | | |
| CORRECTIVE ACTION-FILL-AND-DRAIN VALVES NO LONGER BEING MANUFACTURED BY AIRESEARCH. VALVES NOW IN STOCK ARE BEING REWORKED AND SEALS ARE BEING REPLACED. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | GOC/BKFGS-067/L4-701-00-7113 DUCTING AND TUBING-RIGID | FLIGHT | 7113 051108 | 2-4/PALC -30 | YES YES | | 099950 |
| FAILURE MODE-LEAK-EXTERNAL. LOX LEAKAGE AT UNKNOWN POINT IN THE THRUST SECTION. MOST PROBABLE LEAK POINTS ARE 1) V1 LOX SUPPLY LINE UNION QUAD 3 APEX 12) ENGINE LOX TANK-TO-STAGING DISCONNECT UNION, 3) SUPT. LOX PUMP-TO-LOW PRESSURE DUCT INTERFACE OR BELLOW'S SECTION. | | | | | | | |
| SYSTEM EFFECT-NONE. SYSTEM OPERATION, AS INDICATED BY FLIGHT DATA, WAS NORMAL. LOX LEAKAGE WAS TOO SMALL TO EFFECT PROPULSION SYSTEM OPERATION OR DETECTABLE IN ENGINE DATA. | | | | | | | |
| VEHICLE EFFECT-NONE. LOX LEAK WAS REFLECTED IN LOW ENGINE COMPARTMENT TEMPERATURE DATA DURING COUNTDOWN AND FLIGHT. ALSO EVIDENCE WAS INDICATED IN A FROZEN HYDRAULIC INSTRUMENTATION SENSE LINE (HISOP) BEGINNING AT 105. SEC WHEN H130 P DATA BEGAN TO DROP FROM 3070 PSIA TO 1500 PSIA. | | | | | | | |
| CORRECTIVE ACTION-UNDER INVESTIGATION AT THIS TIME. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | CT-98-08-131 FILL-AND-DRAIN VALVE/SEAL | FAR 27-02102-829 | 051026 | 36A/ETR | YES NO | AIRESEARCH 121072-1 | 090532 |
| FAILURE MODE-EXTERNAL LEAK. LEAKAGE OF 15 SCIM FOUND BETWEEN THE FILL-AND-DRAIN VALVE BODY AND THE MATING SURFACE OF THE ACTUATOR HOUSING WHILE PERFORMING TEST PROCEDURE 36A-3571. ANALYSIS SHOWED PROBLEM CAUSED BY KEL-F SEAL STRESS RELIEVING AND A BENT BUTTERFLY SHAFT SEAL RETAINER. THE KEL-F SEAL HAD NOT BEEN REPLACED SINCE 1961. | | | | | | | |
| CORRECTIVE ACTION-PER CHANGE ORDER LCCB NO-1810-34 FILL-AND-DRAIN VALVES WILL BE CHECKED PRIOR TO LAUNCH TO ENSURE VALVES NOT LEAKING. RECOMMENDED THAT KEL-F SEALS BE REPLACED AT LEAST ONCE A YEAR AND THAT BUTTERFLY SEAL RETAINER MATERIAL BE CHANGED TO TOUGHER MATERIAL TO PREVENT BENDING. ALSO RECOMMENDED THAT RETAINER SCREW TORQUE REQUIREMENTS BE ESTABLISHED. | | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

13 JUN 1968

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM | TEST/REPORT NUMBER | DATE | VEHICLE | SITE | PRI | VENDOR NAME |
|---|---|---------------------|----------------|----------|-------------------------------|----------------|
| SUB-SYSTEM | FAILED COMPONENT NAME | PART NUMBER | DATE | TIME | OTH | VENDOR PART NO |
| PROPULSION INTERFACE-A/B LOX FEED | SLV-98-08-3013P PREVALVE,SPRING | FAR 27-02231-3 | 851011 | 12/ETR | YES B.M. MADLEY NO | 895173 |
| FAILURE MODE-FAIL DURING OPERATION-UNIT REJECTED FOR HIGH OPERATING TORQUE AND A SCRAPING SOUND. CAUSED BY AN IMPROPERLY MANUFACTURED SEAL SPRING AND A BENT SPACER. | | | | | | |
| CORRECTIVE ACTION-VENDOR REQUESTED TO REVIEW ASSEMBLY AND INSPECTION TECHNIQUES AND CLARIFY DRAWINGS. GO/C SOURCE 1 INSPECTORS REQUESTED TO WITNESS FINAL TORQUE MEASUREMENTS MADE BY VENDOR. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | CT-98-08-130 FILL-AND-DRAIN VALVE | FAR 27-02102-829 | 174D 651011 | 38A/ETR | YES AIRESEARCH NO 121072-1 | 890331 |
| FAILURE MODE-LEAK EXTERNAL. LEAKAGE OF 500 SCIM FOUND BETWEEN THE FILL-AND-DRAIN VALVE BODY AND THE MATING SURFACE OF THE ACTUATOR HOUSING WHILE PERFORMING TEST PROCEDURE CTP-PLS-0002. ANALYSIS SHOWED PROBLEM CAUSED BY KEL-F SEAL STRESS RELIEVING AND A BENT BUTTERFLY SHAFT SEAL RETAINER. THE KEL-F SEAL HAD NOT BEEN REPLACED SINCE 1961. | | | | | | |
| CORRECTIVE ACTION-YEAR CHANGE ORDER LCCB NO-1810-34 FILL-AND-DRAIN VALVES WILL BE CHECKED PRIOR TO LAUNCH TO ENSURE VALVES NOT LEAKING. RECOMMENDED THAT KEL-F SEALS BE REPLACED AT LEAST ONCE A YEAR AND THAT BUTTERFLY SEAL RETAINER MATERIAL BE CHANGED TO TOUGHER MATERIAL TO PREVENT BENDING. | | | | | | |
| PROPULSION INTERFACE A/B LOX FEED | SLV-90-08-3014P FILL-AND-DRAIN VALVE, SWITCH | FAR 27-02102-33 | 7111 650830 | 2-4/PALC | YES STRATON NO | 895172 |
| FAILURE MODE-FAIL DURING OPERATION. UNIT REJECTED FOR NO VALVE-OPEN INDICATION AND SLOW OPERATION. INDICATION PROBLEM CAUSED BY SILVER SULPHIDE DEPOSIT ON THE CONTACTS OF THE OPEN SWITCH AND, CORROSION OF THE ROTATING SHAFT CAUSED THE SLOW OPERATION. | | | | | | |
| CORRECTIVE ACTION-REPLACEMENT OF SWITCHES WITH THOSE HAVING GOLD CONTACTS. VENDOR DELETED USE OF MIL-T-8948 LUBRICANT. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | GO/CZMH85-026-0A1057-/L4-7NO-DE-71 11 LOX AIRBORNE FILL AND DRAIN VALVE | COMPOSITE-FRD/DPL | 7111 650812 | 2-4/PALC | YES NO | |
| FAILURE MODE-FAIL DURING OPERATION. LOX AIRBORNE FILL AND DRAIN VALVE (LC-8) REQUIRED 20.30 SECONDS TO CLOSE DURING COMMIT SEQUENCE. THE VALVE FAILED TO OPEN COMPLETELY DURING LOX DRAIN. | | | | | | |
| SYSTEM EFFECT-OPERATION TOO LONG. DRAIN TIME ONE MINUTE LONGER THAN NORMAL. | | | | | | |
| VEHICLE EFFECT-COMPONENTE DELAYED AND RE-SCHEDULED. | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE CIP | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO | |
|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-LOX AIRBORNE FILL AND DRAIN VALVE (LC-2) WAS REPLACED. | | | | | | | 099770 |
| PROPULSION INTERFACE-A/B LOX FEED | FAR-SLV 90-06-3013F VALVE, FILL AND DRAIN, LOX AIRBORNE 27-02102-23 E SHAFT | FAR | 7112 830809 | WTR | YES NO | STRATON 59-480 | 099748 |
| FAILURE MODE-OUT OF TOLERANCE. REJECTED WHEN THE OPERATING CYCLE WAS TOO SLOW. FAILURE CONFIRMED AND ATTRIBUTED TO CORROSION OF THE BUTTERFLY ROTATING SHAFT. CORROSION WAS RESULT OF USE OF MIL-T-5542 LUBRICANT, AN ALCOHOL AND WATER RINSE. THE WATER REACTED WITH THE LUBRICANT CAUSING THE CORROSION. | | | | | | | |
| CORRECTIVE ACTION-VENDOR ELIMINATED USE OF LUBRICANT AND ALCOHOL-WATER RINSE. ALL VALVES FROM SAME LOT WERE RETURNED TO VENDOR FOR REPAIR. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | AAGS-0022/P4-78N-03-5301 LOX Y DUCT | COMPOSITE-FRD/DPL | 5301 830707 | 14/ETR | NO NO | | 099771 |
| FAILURE MODE-STRUCTURAL. THE LOX LOADING VALVES WERE OPERATED OUT OF PROPER SEQUENCE. L-3 WAS OPENED BEFORE THE A/B FILL AND DRAIN VALVE. AS A RESULT THE LOX Y DUCT WAS DAMAGED. | | | | | | | |
| SYSTEM EFFECT-LOSS OF STRUCTURAL INTEGRITY. THE LOX Y DUCT WAS STRUCTURALLY DAMAGED DUE TO THE TOPPING PRESSURE CREATING A HAMMER EFFECT BECAUSE THE A/B FILL AND DRAIN VALVE WAS STILL CLOSED. | | | | | | | |
| VEHICLE EFFECT-COMPOSITE DELAYED. | | | | | | | |
| CORRECTIVE ACTION-A CAUTION NOTE WAS ADDED TO THE PROCEDURE TO PRECLUDE THIS PROBLEM. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | SLV-90-06-3013F FILL AND DRAIN VALVE-SHAFT | FAR 27-02102-33 | 7112 830702 | 2-4/PALC | YES NO | STRATON | 099171 |
| FAILURE MODE-OUT OF TOLERANCE. UNIT REJECTED FOR OPERATING CYCLE BEING TOO SLOW. AS RESULT OF CORROSION OF THE BUTTERFLY ROTATING SHAFT. CORROSION WAS THE RESULT OF USING MIL-T-5542 LUBRICANT AND A WATER-ALCOHOL RINSE. | | | | | | | |
| CORRECTIVE ACTION-VENDOR ELIMINATED USE OF MIL-T-5542 LUBRICANT. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | BRF85-051/P3-48N-03-225 LOX BREAKAWAY VALVE | COMPOSITE-FRD/DPL | 225D 830630 | 13/ETR -126 | NO NO | | |
| FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE. LOX TEMPERATURE AT LOX BREAKAWAY VALVE ABOVE REDLINE. | | | | | | | |
| SYSTEM EFFECT-NONE. TEMPERATURE AT LOX BREAKAWAY VALVE TOO HIGH. | | | | | | | |
| VEHICLE EFFECT-COUNTDOWN RESCHEDULED. | | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REVIEW-PROPOSITION INTERFACE SYSTEM-AIRBORNE

| S/SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF TIME DIF | SITE FACTORY | PRI OTH | VENDOR NAME VENDOR PART NO |
|---|---|--------------------------------|------------------------------|-----------------|------------|-------------------------------|
| CORRECTIVE ACTION-INSULATION ADDED TO LOX LINES. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 89A3989-2 SUSTAINER LOX START LINE | UTP-PAT 27-02186-3 | 850828 | FACTORY | YES | FLEXMETAL NO 10071 |
| FAILURE MODE-STRUCTURAL. DURING SPECIMEN EXAMINATION FOLLOWING 80 FLEXING CYCLES AT 6 PSIG GAGE, OBSERVATION REVEALED THE POINT D B-NUT WAS BINDING ON THE SLEEVE SO THAT NO FREE MOVEMENT WAS POSSIBLE. THE SPECIMEN HAD BEEN INSTALLED 19 TIMES AND TORQUED TO 950 IN-LBS EACH TIME. REF S/N 403-0140 T.H.MO4. | | | | | | |
| CORRECTIVE ACTION-REDESIGN THE TEST FIXTURE AND REVISE THE TEST PROCEDURE TO DECREASE THE NUMBER OF TIMES THE TORQUING IS REQUIRED. REF CITEM NO 531-1-014. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 89A3989-2 SUSTAINER LOX START LINE | UTP-PAT 27-02186-3 | 850823 | FACTORY | YES | FLEXMETAL NO 10071 |
| FAILURE MODE-STRUCTURAL. DURING PAT POSTVIBRATION EXAMINATION OF SPECIMEN IT WAS DISCOVERED THAT SEVERAL WIRE STRANDS IN THE MIDDLE FLEX HAD BEEN CUT AND MARKED. THE TYPE OF CUT APPEARED TO BE INCURRED BY SOME TYPE OF GRINDING DEVICE. REF S/N 403-0148 T.H. MO8. | | | | | | |
| CORRECTIVE ACTION-DISCONTINUE TEST. RETURN SPECIMEN TO VENDOR FOR FAILURE ANALYSIS AND REWORK. REF CITEM NO 531-1-013. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 89A3989-2 SUSTAINER LOX START LINE | UTP-PAT 27-02186-3 | 850817 | FACTORY | YES | FLEXMETAL NO 10071 |
| FAILURE MODE-STRUCTURAL. DURING EXAMINATION FOLLOWING COMPLETION OF THE 1500 PSIG PRECURSORIZATION WITH GAGE OBSERVATION REVEALED THE POINT D B-NUT WAS BINDING ON THE SLEEVE SO THAT NO FREE MOVEMENT WAS POSSIBLE. THE SPECIMEN HAD BEEN TORQUED TO 950 IN-LBS EACH TIME IT WAS INSTALLED IN A FIXTURE. THE NUMBER OF TORQUINGS REQUIRED DUE TO TEST FIXTURE DESIGN AND TEST PROCEDURES WAS EXCESSIVE. REF. S/N 403-0148 T.H.MO 2. | | | | | | |
| CORRECTIVE ACTION-REDESIGN THE TEST FIXTURE AND REVISE THE TEST PROCEDURE TO DECREASE THE NUMBER OF TIMES THE TORQUING IS REQUIRED. REF. CITEM NO 531-1-010. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A4322 LOX FILL AND DRAIN VALVE SWITCH | UTP-PET 27-02182-33 | 850815 | 60/C | YES | STRATOS NO 58-460-01 |
| FAILURE MODE-ERRATIC OPERATION. DURING PET LIFE TEST THE VALVE OPEN MICROSWITCH INDICATING CIRCUIT MALFUNCTIONED INTERMITTENTLY. THE FIRST DISCREPANCY OCCURRED DURING THE SIXTH LIFE CYCLE WHICH WAS AFTER THE VALVE HAD BEEN SUBJECTED TO 90 COLD SHOCK SWITCHING CYCLES, 8 AXIS OF CYCLOSTIC VIBRATION, 6 POST-VIBRATION SWITCHING PROOF CYCLES, AND 30 NO RE CYCLOSTIC SWITCH CYCLES. DUE TO THE EXTENSIVE TESTING THE FAILURE IS CONSIDERED MINOR. REF. S/N 307-3089 T.H. NO | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO | |
|---|---|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| 1. | | | | | | | 992432 |
| | CORRECTIVE ACTION-NONE ON THE TEST. THE PET LOT WAS ACCEPTED. THE PET PROCEDURE WAS REVISED AND THE COLD SOAK TEST REMOVED, AND THE VIBRATION TESTING PERFORMED AFTER LIFE TESTING WHICH WAS REDUCED. REF. T.H. NO 531-1-009. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 99A 3969-2 SUSTAINER LOX START LINE | UTP-PAT 27-02188-3 | 650609 | FACTORY | YES | FLEXMETAL NO 10071 | 992449 |
| FAILURE MODE-LEAK-EXTERNAL. DURING PAT IAT PROOF CYCLE A, WHILE PRESSURIZED UNDERWATER TO 1500 PSIG WITH GNE. THE SPECIMEN LEAKED 4 BUBBLES PER MINUTE AT THE WELDED END OF THE MIDDLE FLEX SECTION NEAREST THE LESS THAN 90 DEGREES BE NO END. REF.. 3/N 408-0139 T.H. NO 1. | | | | | | | |
| | CORRECTIVE ACTION-STOP TEST. RETURN SPECIMEN TO VENDOR FOR FAILURE ANALYSIS AND REMOVAL. REF. IR 4067430 AND CYCTH NO 531-1-008. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A4029 LOX CHECK VALVE | UTP-PET 27-02403-3 | 650310 | FACTORY | YES | PARKER NO 2830013 | 992322 |
| FAILURE MODE-OUT OF SPECIFICATION. DURING PET POST-VIBRATION LEAKAGE CHECK THE SPECIMEN LEAKED 809 SCIM AT 400 PSIG, 308 SCIM AT 1000 PSIG, AND 408 SCIM AT 400 PSIG. ALLOWABLE LEAKAGE IS 500 SCIM. REF. 3/N 408-0226 T.H. NO. 4. | | | | | | | |
| | CORRECTIVE ACTION-NONE. REF. CYCTH NO. 531-1-004. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | B2-4MO-01-177 VALVE, SWITCH | COMPOSITE-FRD/DPL | 1770 650500 | B-2/ATR | YES | NO | 994370 |
| FAILURE MODE-ERRATIC OPERATION. AFTER LOX DRAIN WAS COMPLETE THE LOX A/B P/D VALVE (LC-2) INDICATED NOT CLOSED INTE RHITTANTLY. BELIEVED CAUSED BY FAULTY VALVE POSITION SWITCH. | | | | | | | |
| SYSTEM EFFECT-ERRATIC OPERATION. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| | CORRECTIVE ACTION-SWITCH WAS TO BE CHECKED. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 60C/22M45-013-DA1047-1/LA-7MO-01-71 07 LOX ORIFICE B-NUT | COMPOSITE-FRD/DPL | 7107 630419 | B-4/PALC | YES | NO | |
| FAILURE MODE-LEAK-EXTERNAL. A SMALL LOX LEAK NEAR THE VE ENGINE WAS NOTED WHEN THE VERNIER LOX BLEEDS WERE CLOSED A T ENGINE TANKS PRESSURIZATION DURING COMMIT. POST TEST INSPECTION DISCLOSED A LOOSE B NUT AT THE 60/C LOX ORIFICE. | | | | | | | |

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CONVAIR DIVISION

15 JUN 1963

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-A1990RME

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO | |
|---|---|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| SYSTEM EFFECT-NONE. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-RE-TORQUED 8 NUT. | | | | | | | 899603 |
| PROPULSION INTERFACE-A/B LOX FEED | 27A4029 LOX CHECK VALVE | UTP-PET 27-02403-3 | 830406 | FACTORY | YES | PARKER NO 2430013 | 892335 |
| FAILURE MODE-OUT OF SPECIFICATION.DURING PET PRE-VIBRATION TEST OPERATION AND LEAKAGE CHECK, THE SPECIMEN LEAKED 34 9 SCIM AT 400 PSIG. ALLOWABLE IS 300 SCIM. REF. S/N 409-0226 T.M. NO. 3. | | | | | | | |
| CORRECTIVE ACTION-NONE. REF. CTCTH NO. 931-1-003. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A4029 LOX CHECK VALVE, SEAL | UTP-PET 27-02403-3 | 830401 | FACTORY | YES | PARKER NO 2430013 | 892340 |
| FAILURE MODE-OUT OF SPECIFICATION.DURING PET PROOF CYCLES AFTER 500 CYCLES THE INTERNAL LEAKAGE WAS 1000 SCIM AT 40 0 PSIG AND 1500 SCIM AT 1000 PSIG. ALLOWABLE LEAKAGE IS 300 SCIM. THE POPPET SEATING AREA WAS FOUND TO BE BADLY CHIPP ED. REF. S/N 409-0226 T.M. NO. 2. | | | | | | | |
| CORRECTIVE ACTION-NONE. REF. CTCTH NO. 931-1-002. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A4029 LOX CHECK VALVE | UTP-PET 27-02403-3 | 830401 | FACTORY | YES | PARKER NO 2430013 | 892339 |
| FAILURE MODE-OUT OF TOLERANCE. DURING PET PROOF CYCLES AFTER 500 AND 1000 CYCLES, THE SPECIMEN CRACKING PRESSURE WA S 0.019 PSID. ALLOWABLE CRACKING PRESSURE RANGE IS 0.08 TO 1.0 PSID. REF. S/N 409-0226 T.M. NO. 2. | | | | | | | |
| CORRECTIVE ACTION-NONE. REF. CTCTH NO. 931-1-002. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A4257 LOX FILL AND DRAIN VALVE BOLTS | UTP-PET 27-02102-33 | 830222 | FACTORY | YES | STRATON NO 59-480-01 | |
| FAILURE MODE-OUT OF SPECIFICATION. DURING PET PROOF PRESSURE TEST AT 110 PSIG WITH VALVE BLADE CLOSED. EXCESSIVE LE AKAGE WAS OBSERVED IN THE MIDPLANGE AREA. A TORQUE CHECK OF THE BOLTS AND SCREWS REVEALED ONLY 7 OUT OF 38 BOLTS WIT HIN THE SPECIFIED TORQUE LIMITS. EXCESSIVE GAP WAS ALSO MEASURED IN THE MIDPLANGE MATING AREAS. REF S/N 409-3200 T.M . NO. 2. | | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO |
|--------------------------------------|--|--------------------------------|---------------------|------------------|-----------------------------|-------------------------------|
| | | | | | | 892481 |
| | <p>CORRECTIVE ACTION-REJECT THE VALVE AND RETURN ALL VALVES IN LOT TO VENDOR FOR REINSPECTION AND REMARK AS NECESSARY. INITIATE ACTION TO HAVE VENDOR INCLUDE IN IAT A TORQUE CHECK AND RETORQUING AS NECESSARY WHEN THE VALVE IS FILLED WITH LN2 AND AGAIN WHEN THE VALVE WARMS UP. INITIATE FOLLOW-UP ACTION TO TIGHTEN UP VENDOR SC. REF. T.H. NO 682-6-026 (LOT NO.2).</p> | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A4257 LOX FILL AND DRAIN VALVE | UTP-PET 27-02102-33 | 650219 | FACTORY | YES STRATOS NO 59-480-01 | 892483 |
| | <p>FAILURE MODE-CONTAMINATION. DURING EXAMINATION OF PRODUCT A WHITE CHALK LIKE SUBSTANCE WAS STICKING TO THE BUTTERFLY VALVE. (PET LOT CONTROL TEST) THE VENDOR WAS NOT ENFORCING OR ADHERING TO LUBRICANT AND CLEANING RESTRICTIONS AND REQUIREMENTS OF HIS ASSEMBLY PROCEDURES AND DRAWINGS. REF S/N 403-3200 T.H.NO.1.</p> | | | | | |
| | <p>CORRECTIVE ACTION-REJECT THE VALVE AND RETURN ALL VALVES IN LOT TO VENDOR FOR REINSPECTION AND REMARK AS NECESSARY. INITIATE FOLLOW-UP ACTION TO TIGHTEN UP VENDOR SC. REF T.H.NO682-6-022 (LOT NO.2).</p> | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A4257 LOX FILL AND DRAIN VALVE BOLTS | UTP-PET 27-02102-33 | 650219 | FACTORY | YES STRATOS NO 59-480-01 | 892482 |
| | <p>FAILURE MODE-OUT OF SPECIFICATION. DURING PET EXAMINATION OF PRODUCT THE MIDFLANGE BOLTS WERE TORQUE CHECKED AND WERE FOUND BELOW SPECIFIED LIMITS UNDER THE VALVE OUTLET. THE VENDOR WAS NOT ENFORCING TORQUING REQUIREMENTS OF HIS ASSEMBLY PROCEDURES AND DRAWINGS. REF S/N 403-3200 T.H. NO 1.</p> | | | | | |
| | <p>CORRECTIVE ACTION-REJECT THE VALVE AND RETURN ALL VALVES IN LOT TO VENDOR FOR REINSPECTION AND REMARK AS NECESSARY. INITIATE FOLLOW-UP ACTION TO TIGHTEN UP VENDOR SC. REF T.H. NO 682-6-022 (LOT NO.2).</p> | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A465-0007/P2-401-00-196 VALVE-PRE LOX | COUNTDOWN | 1960 650217 | 12/ETR -9700 | NO NO | 892485 |
| | <p>FAILURE MODE-OUT OF TOLERANCE. THE CAUTION FLAG ATTACHED TO THE LOX PRE-VALVE WAS NOT REMOVED WHEN THE VALVE WAS OPENED.</p> | | | | | |
| | <p>SYSTEM EFFECT-NONE.</p> | | | | | |
| | <p>VEHICLE EFFECT-COUNTDOWN DELAYED FOR 10 MINUTES.</p> | | | | | |
| | <p>CORRECTIVE ACTION-TOWER WAS RETURNED TO LAUNCHER IN ORDER TO REMOVE THE LOX PRE-VALVE CAUTION FLAG.</p> | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME PART NO | |
|--|---|--------------------------------|---------------------|------------------|------------|---------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | 27A3602 BOOSTER LOX START NOSE ASBY | UTP-PET 27-02173-3 | 650216 | FACTORY | YES | FLEX METAL NO H3488-37 | 992329 |
| FAILURE MODE-LEAK EXTERNAL. A LEAK CHECK WITH SPECIMEN SUBMERGED IN WATER USING 6H. AT AMBIENT TEMPERATURE FOLLOWING 6 THE PET FLEX CYCLED REVEALED A LEAK IN THE BRAID NEAR THE SHORT TUBULAR END. REF. S/N 403-0184 T.M. NO. 1. | | | | | | | |
| CORRECTIVE ACTION-STOP TESTING. REJECT LOT BACK TO VENDOR. REF. CTCH NO. 602-6-021. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 69A3832.2 LOX FILL AND DRAIN VALVE | UTP-SLT 27-02102-33 | 650212 | FACTORY | YES | STRATOS NO 59-460-01 | 992460 |
| FAILURE MODE-LEAK-EXTERNAL. DURING BURST PRESSURE TEST FOLLOWING SLT VIBRATION LEAKAGE WAS OBSERVED AT 200 PSIG BY THE SPLINED SHAFT OF BUTTERFLY VALVE AND MIDFLANGE BOLTS NO 3 AND 4 ON BOTH SIDES OF THE CENTERLINE OF THE VALVE OUT LET. THE TORQUE ON THE BOLTS IN THESE AREAS WAS FOUND TO BE RELAXED. REF S/N 403-3214 T.M. NO 6. | | | | | | | |
| CORRECTIVE ACTION-CHECK TORQUE ON LEAKING BOLTS. NO FURTHER ACTION SINCE VALVE HAD BEEN SUBJECTED TO EXCESSIVE VIBRATION LOADS DURING SLT RANDOM VIBRATION TESTS. REF T.M. NO 602-6-020. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 69A3832.2 LOX FILL AND DRAIN VALVE | UTP-PRT 27-02102-33 | 650127 | FACTORY | YES | STRATOS NO 59-460-01 | 992459 |
| FAILURE MODE-LEAK. DURING PRT INITIAL ACCEPTANCE TEST THE VALVE LEAKED 74 CC/MIN THRU THE BUTTERFLY SEAL WITH 20 PSIG 16 GNE. ALLOWABLE LEAKAGE IS 2 CC/MIN. REF S/N 403-3214 T.M. NOS. | | | | | | | |
| CORRECTIVE ACTION-CYCLE THE BUTTERFLY VALVE OPEN AND CLOSED AND CHECK GNE LEAKAGE RATE AT 20 PSIG EVERY FIFTH CYCLE. LEAKAGE DROPPED TO LESS THAN 2 CC/MIN AFTER FIFTH CYCLE. CONTINUE TESTING. REF T.M. NO 602-6-016. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A4237 LOX FILL AND DRAIN VALVE | UTP-PET 27-02102-33 | 650123 | FACTORY | YES | STRATOS NO 59-460-01 | 992458 |
| FAILURE MODE-OUT OF SPECIFICATION. THE EXTERNAL MATING FLANGES WERE FOUND TO BE DIMENSIONALLY OUT OF TOLERANCE SO THAT THE VALVE COULD NOT BE MATED TO THE TEST FIXTURE. THE VENDOR INSPECTION METHOD FOR THIS ASSEMBLY EMPLOYED THE USE OF A POINT REFERENCE FOR RELATED DIMENSIONS INSTEAD OF A POINT AND FIXED PLANE REFERENCE. REF S/N 408-3231 T.M. NO 1 AND 2. | | | | | | | |
| CORRECTIVE ACTION-REJECT THE VALVE AND RETURN TO VENDOR FOR REMARK. ALL VALVES IN LOT WERE REJECTED AND RETURNED TO VENDOR FOR REINSPECTION AND REMARK AS REQUIRED. REF IR NO W03048 AND T.M. NO 602-6-019. (LOT NO 2). | | | | | | | |

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| PROPULSION INTERFACE-A/B LOX FEED | 69A3852-2 LOX FILL AND DRAIN VALVE | UTP-PRT 27-02102-33 | 650114 | FACTORY | YES NO | STRATOS 59-460-01 |
| <p>FAILURE MODE-OUT OF TOLERANCE. DURING PRT-1AT PROOF CYCLE EXCESSIVE INTERNAL GHE AND GHE LEAKAGES WERE NOTED. WITH 20 PSIG GHE THE LEAKAGE PAST THE BUTTERFLY SEAL WAS 180 CC/MIN. WITH 2 PSIG GHE THE LEAKAGE WAS 200 CC/MIN. MAXIMUM ALLOWABLE LEAKAGE IS 2 CC/MIN IN BOTH CASES. THE FAILURE WAS CAUSED BY THE SEAL BEING TOO LARGE IN DIAMETER. REF S/N 412-3145 T.H. NO2 AND 4.</p> <p>SYSTEM EFFECT-NONE.</p> <p>VEHICLE EFFECT-NONE.</p> <p>CORRECTIVE ACTION-STOP TESTING. RETURN SPECIMEN TO VENDOR FOR REMOK. OBTAIN REPLACEMENT VALVE AND RESTART TEST. RE F S/N 412-3145 T.H. NO 4 AND IN NO W-051036.</p> | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 69A3852-2 LOX FILL AND DRAIN VALVE NUTS | UTP-PRT 27-02102-33 | 650114 | FACTORY | YES NO | STRATOS 59-460-01 |
| <p>FAILURE MODE-OUT OF TOLERANCE. DURING INITIAL PRT PROOF CYCLE SEVERAL EXTERNAL LN2 LEAKS OCCURRED AT 100 PSIG. LOCATION OF LEAKAGE WAS BOLTS AT BUTTERFLY VALVE SHAFT, AND MIDWAY BETWEEN SHAFTS BELOW DRAIN FLANGE SIDE OF VALVE. THEN TY-SIX OF THE THIRTY-SIX SCREWS WHICH JOIN THE VALVE ELBOW TO THE BODY WERE AT APPROXIMATELY ONE-HALF TORQUE. REF S/N 412-3145. /T.H. NO2 AND 3.</p> <p>CORRECTIVE ACTION-RETORQUE ALL BOLTS TO SPEC REQUIREMENTS. RECHECK EXTERNAL LN2 LEAKAGE. REJECT ALL VALVES IN THIS LOT TO VENDOR FOR REINSPECTION AND REMOK AS NECESSARY. INITIATE FOLLOW-UP QA ACTION TO TIGHTEN UP VENDOR QC. REF DO I NO 400819. AND S/N 412-3145 T.H. NO 3.</p> | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A3390 LOX MANUAL PRE-VALVE | UTP-PET 27-02251-3 | 650111 | FACTORY | YES NO | B.H. MADLEY 10713-7 |
| <p>FAILURE MODE-LEAKAGE. THE INTERNAL LEAKAGE RATE OF 300 SCCM EXCEEDED THE ALLOWABLE MAXIMUM OF 50 SCCM WHEN PRESSURE INCREASED TO 4 PSIG. THE BUTTERFLY WAS FOUND TO BE SLIGHTLY CORRODED AND A RUST FILM ADHERED TO THE INSIDE OF THE VALVE BODY.</p> <p>CORRECTIVE ACTION-REVISE THE PET TEST PROCEDURE TO INSURE THAT THE WATER UTILIZED DURING THE DYNAMIC FLUTTER TEST IS FREE OF CONTAMINATES SUCH AS CAUSED THIS FAILURE.</p> | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A4029 LOX CHECK VALVE | UTP-PET 27-02403-3 | 650109 | FACTORY | YES NO | PARKER 2830013 |
| <p>FAILURE MODE-OUT OF TOLERANCE. DURING PET 1AT TESTS, THE SPECIMEN CRACKING PRESSURE WAS 0.014 PSID. ALLOWABLE CRACKING PRESSURE RANGE IS FROM 0.03 TO 1.0 PSID. REF. S/N 408-0288 T.H. NO. 1.</p> | | | | | | |

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|--|---|--------------------------------|---------------------|----------------------|---------------------------|----------------|
| CORRECTIVE ACTION-NONE. REF. CTCTH NO. 331-1-001. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 09A3969.1 SUSTAINER LOX START LINE | UTP-PAT 27-02168-5 | 641216 | FACTORY | YES FLEXMETAL NO 10071 | 092334 |
| FAILURE MODE-LEAK-EXTERNAL. DURING PAT FINAL SATISFACTORY PERFORMANCE UNDERWATER LEAK TEST FOLLOWING IAT, EOP AND X-AXIS VIBRATION TEST THE SPECIMEN LEAKED 5 BUBBLES/MINUTE AT THE TERMINAL CAP OF THE WIRE BRAID OF THE CENTER FLEX S ACTION WHEN EXPOSED TO 1500 PSI GAGE. REF. S/N 403-0142 T.H. NO 7. | | | | | | |
| CORRECTIVE ACTION-STOP TEST. RETURN SPECIMEN TO VENDOR FOR FAILURE ANALYSIS AND REMOVAL. REF. IN 090790 AND CTCTH 66 2-6-008. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 09A3969.1 SUSTAINER LOX START LINE | UTP-PAT 27-02168-5 | 641214 | FACTORY | YES FLEXMETAL NO 10071 | 092447 |
| FAILURE MODE-LEAK-EXTERNAL. DURING PAT UNDERWATER LEAK TEST FOLLOWING EOP, IAT, AND X-AXIS VIBRATION TEST, THE SPECIMEN LEAKED 0.5 SCCM AT THE WELDED TERMINAL CAP OF THE SHORTER SECTION WHEN EXPOSED TO 750 PSIG GAGE. REF. S/N 403-0146 T.H. NO. 8. | | | | | | |
| CORRECTIVE ACTION-STOP TEST. RETURN SPECIMEN TO VENDOR FOR FAILURE ANALYSIS AND REMOVAL. REF. IN 090790 AND CTCTH-66 2-6-007. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 09A3969.1 SUSTAINER LOX START LINE | UTP-PAT 27-02168-5 | 641206 | FACTORY | YES FLEXMETAL NO 10071 | 092446 |
| FAILURE MODE-LEAK-EXTERNAL. DURING PAT IAT THE SPECIMEN LEAKED 0.25 SCCM FROM THE WIRE BRAID ON THE SHORTER OF THE TWO END SECTIONS WHEN EXPOSED TO 1500 PSIG GAGE UNDER WATER. REF. S/N 408-0174 TH. NO. 9. | | | | | | |
| CORRECTIVE ACTION-STOP TEST. RETURN SPECIMEN TO VENDOR FOR FAILURE ANALYSIS AND REMOVAL. REF. IN 092337 AND CTCTH NO. 62-6-008. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 09A3969.1 SUSTAINER LOX START LINE | UTP-PAT 27-02168-5 | 641207 | FACTORY | YES FLEXMETAL NO 10071 | 092446 |
| FAILURE MODE-LEAK-EXTERNAL. DURING PAT IAT THE SPECIMEN LEAKED 7 SCCM AROUND THE TERMINAL CAP OF THE WIRE BRAID IN THE LONGER END SECTION WHEN EXPOSED TO 1500 PSIG GAGE UNDER WATER. REF. S/N 408-0159 T.H. NO. 10. | | | | | | |

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|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| | | | | | | | 892443 |
| | CORRECTIVE ACTION-STOP TEST. RETURN SPECIMEN TO VENDOR FOR FAILURE ANALYSIS AND REMORK. REF. IN 976969 AND CTCM NO 862-6-004. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 89A3989-1 SUSTAINER LOX START LINE | UTP-PAT 27-02168-3 | 641130 | FACTORY | YES NO | FLEXMETAL 10071 | 892444 |
| FAILURE MODE-LEAK-EXTERNAL. DURING 1AT THE SPECIMEN LEAKED 5 SCCM WHEN EXPOSED TO 1500 PSIG GME UNDERWATER. LEAKAGE OCCURRED AT THE WIRE BRAID TERMINAL CAP OF THE CENTER SECTION. REF. 8/M05-0140 T.M.N03. | | | | | | | |
| | CORRECTIVE ACTION-STOP TEST. RETURN SPECIMEN TO VENDOR FOR FAILURE ANALYSIS AND REMORK. REF. IN NO 976963 AND CTCM NO 862-6-003. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | WSE-303/N/A VALVE, FILL AND DRAIN | COUNTDOWN | 106F 641119 | G/WTR | YES NO | | 896592 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. INDICATION ON LCC THAT LOX AIRBORNE FILL AND DRAIN VALVE HAD NOT OPENED. | | | | | | | |
| SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS. | | | | | | | |
| VEHICLE EFFECT-COUNTDOWN ABORTED. | | | | | | | |
| CORRECTIVE ACTION-NONE PROPER VALVE INDICATIONS WERE RECEIVED DURING ABORT SEQUENCE AND DURING POST-TEST INVESTIGATIONS. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 89A3852 LOX FILL AND DRAIN VALVE, SEAL | UTP-PAT 27-02102-33 | 641114 | FACTORY | YES NO | STRATOS 58-460-01 | 890960 |
| FAILURE MODE-EXTERNAL LEAKAGE. DURING PROOF CYCLE FOLLOWING 2-AXIS PRT VIBRATION, AT 65 PSIG IN2, LEAKAGE WAS OBSERVED BENEATH THE BUTTERFLY VALVE SHAFT END COVER. THE LEAKAGE CEASED WHEN PRESSURE WAS RELEASED. LEAKAGE INITIALLY OCCURRED AT 25 PSIG AT THE LOWER R/I SCREW AROUND THE LOWER EDGE. UPON PARTIAL DISASSEMBLY, TWO LONG SCRATCHES WERE FOUND ON THE SEALING FACE OF THE SEAL SEAT. REF. 8/M01-3083 T.M. NO-2. | | | | | | | |
| CORRECTIVE ACTION-OVER TORQUE ALL SCREWS, HOLDING THE SHAFT END COVER, TO 45 IN/LBS FOR TEST PURPOSES ONLY. INITIATE A CARR AND VCAR TO IMPROVE VENDOR S.C. | | | | | | | |

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|---|---|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | GOA/BKF84-049/P3-401-00-288/3800 LOX LINE-SEAL | FLIGHT | 289D 641103 | 13/ETR 22. | YES NO | | 093928 |
| FAILURE MODE-OUT OF EXPECTED VALUE. LOX LEAK SUSPECTED AREAS ARE SUSTAINER LOX BOOTSTRAP LINE AT CHECK VALVE, LOX PUMP INLET AND VOLUME, H3 VALVE AREA AND LOX MANIFOLD. | | | | | | | |
| SYSTEM EFFECT-LOW TEMPERATURE ENVIRONMENT. INSTRUMENTATION SENSE LINES FOR MEASUREMENT OF SUSTAINER FUEL PUMP INLET AND DISCHARGE PRESSURES WERE FROZEN. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-FEASIBILITY OF INSULATING SENSE LINES IS BEING STUDIED. AN ADDITIONAL LEAK CHECK WILL BE PERFORMED ON X MINUS 1 DAY FOR SUBSEQUENT VEHICLES. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | LV-98-08-3001F FILL AND DRAIN VALVE, SCREW | FAR 27-02102-029 | 289D 641001 | 12/ETR 174 | YES NO | YES AIRSEARCH | 098494 |
| FAILURE MODE-LEAK EXTERNAL. LEAKAGE WAS OBSERVED FROM THE PARTING SURFACE OF THE ACTUATOR AND VALVE BODY. CAUSE WAS UNEVEN PRESSURE OF THE FOUR ATTACH SCREWS ON RETAINING PLATE AND SEAL. 1 OTHER CASE REPORTED IN FAR LV-98-08-3012F. | | | | | | | |
| CORRECTIVE ACTION-VENDOR CONSIDERED PRESENT PROCEDURES ADEQUATE. NO ACTION TAKEN. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | GOA-AP284-064/AS-401-00-247 ENGINE LOX TANK PRESS. FITTING | FLIGHT | 247D 640922 | A-3/MTR 174 | YES NO | | 098481 |
| FAILURE MODE-LEAK EXTERNAL. HELIUM LEAKAGE AT ENGINE LOX TANK PRESSURIZATION FITTINGS. ENGINE LOX TANK PRESSURE RISE FROM 865 PSIA TO 845 PSIA BETWEEN 173.7 AND 177.0 SECONDS. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-PRESENT BULKHEAD TYPE FITTINGS REPLACED WITH FLANGE TYPE FITTINGS. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | LV-98-08-295F FILL AND DRAIN VALVE, SEAL | FAR 27-02102-23 | 333D 640919 | E-3/PALC 174 | YES NO | YES STRATOR | 093988 |
| FAILURE MODE-CONTAMINATION. UNIT REJECTED FOR A DARK COLORED MATERIAL ON THE LIP SEAL. MATERIAL WAS FOUND TO BE LOX-SAFE. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |

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| 300-SYSTEM | FAILED COMPONENT NAME | PART NUMBER | DATE DIF | TIME DIF | OTH | VENDOR PART NO |
| PROPULSION INTERFACE-A/B LOX FEED | GOA/BKFB4-038/L4-403-00-7101 VI LOX ORIFICE | FLIGHT 69-22120-17 | 7101 640814 | 2-4/PALC | YES 60/C NO | 999063 |
| <p>FAILURE MODE-OUT OF TOLERANCE. HIGHER THAN PLANNED THRUST IN THE VI ENGINE CAUSED BY THE ABSENCE OF THE 60/C LOX ORIFICE IN THE VI ENGINE SYSTEM. ORIFICE WAS PROBABLY LOST BETWEEN THE TIME THE VERNIERS WERE REMOVED FOR CLEANING FOLLOWING THE FRF AND THE TIME THE REPLACEMENT ENGINES WERE INSTALLED IN THE FIELD.</p> <p>SYSTEM EFFECT-OPERATION TOO HIGH. VI ENGINE THRUST APPROXIMATELY 25 PCT HIGHER THAN V2.</p> <p>VEHICLE EFFECT-NONE. THRUST IMBALANCE CORRECTED BY FLIGHT CONTROL SYSTEM.</p> <p>CORRECTIVE ACTION-APPROPRIATE QUALITY CONTROL MEASURES AND HARDWARE REDESIGN TO PROVIDE A LOCK-IN FEATURE FOR THE ORIFICE WERE INITIATED TO PRECLUDE RECURRENCE OF THE PROBLEM.</p> | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | SLV-90-06-280F Y DUCT BOSS | FAR 7-23209-821 | 7101 640807 | 2-4/PALC | YES 60/C NO | 999169 |
| <p>FAILURE MODE-STRUCTURAL. TWO UNITS REJECTED FOR WELD CRACKS WHILE AT COMPLETING SURVEY 86-84. CRACKED BOSS WELDS WERE CAUSED BY EXCESSIVE NON-METALLIC INCLUSIONS, UNRELIEVED STRESSES, AND APPLICATION OF AN EXTERNAL FORCE CAUSING THE BOSS TO FAIL AT ITS WEAKEST POINT. 3 OTHER CASES REPORTED ON FAR 51-08-2461-2761-2781-3000.</p> <p>CORRECTIVE ACTION-60/C INSTITUTED 100 PCT. RADIO-GRAPHIC INSPECTION OF WELDS BEFORE AGE HARDENING, SUCH INSPECTION AFTER AGE HARDENING WAS RETAINED. THE TRANSDUCER LOCATION WAS CHANGED FROM THE FAILED BOSS TO ANOTHER BOSS. A SUPPORT BRACKET WAS ADDED FOR A TRANSDUCER.</p> | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | LV-99-06-292F FILL AND DRAIN VALVE, SEAL | FAR 27-02102-829 | 104D 640782 | FACTORY | YES AIRSEARCH NO | 999179 |
| <p>FAILURE MODE-LEAKAGE. UNIT REJECTED FOR INTERNAL LEAKAGE CAUSED BY A NYLON BRUSH BRISTLE LOOSED BETWEEN BUTTERFLY SEAL AND VALVE WALL.</p> <p>CORRECTIVE ACTION-60/C FACTORY AND VENDOR ADMONISHED TO BE MORE CAREFUL WHEN USING BRUSHES.</p> | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | LV-98-06-283F FILL AND DRAIN VALVE | FAR 27-02102-23 | 216D 640630 | 13/ETR | YES STRATOS NO 59-487 | |
| <p>FAILURE MODE-OUT OF TOLERANCE. UNIT REJECTED FOR A CRACKED WELD. FOUR CRACKS WERE FOUND IN OR ADJACENT TO WELDS AND ARE ATTRIBUTED TO IMPROPER WELDING AND INSPECTION TECHNIQUES.</p> <p>CORRECTIVE ACTION-VENDOR ADDED FLOURESCENT-PENETRANT INSPECTION TO HIS MP8 IN MAY 1962. THIS VALVE WAS ACCEPTED PRI</p> | | | | | | |

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|--|---|--------------------------------|---------------------|------------------|---------------------------|-------------------------------|
| OR TO THAT DATE. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-80-06-262C Y DUCT MANIFOLD, BOSS | FAR 7-23E05-821 | 243D 840618 | WTR | YES 60/C NO | |
| FAILURE MODE-STRUCTURAL. UNIT WAS REJECTED FOR AN INSTRUMENTATION BOSS WELDMENT CRACK. NO FAILURE ANALYSIS PERFORMED. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | FR69M-2683.3 BOOSTER LOX START NOSE ASSY | UTP-PRT 27-02173-801 | 840623 | FACTORY | NO FLEX METAL NO 10070 | |
| FAILURE MODE-OUT OF TOLERANCE. DURING PRT WITH THE TEST SPECIMEN PRESSURIZED TO 800 PSIG USING LINE THE FORCE REQUIRED TO DEFLECT POINT F WAS 85 POUNDS VS 80 POUNDS ALLOWABLE. REF. S/N 318-0121 T.H. NO. H-44922-6. | | | | | | |
| CORRECTIVE ACTION-NONE. THE TEST FIXTURE IMPOSED IMPROPER RESTRAINTS ON THE CENTER OF THE NOSE FLEX SECTION WHICH GAVE READINGS AT LEAST TWICE THE AMOUNT THAT SHOULD HAVE BEEN. REF. RTE 27-02173-801-2800TA84. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | GOA/APZ64-033/A1-401-00-243 SENSING LINE | FLIGHT | 243D 840618 | A-1/WTR 193 | YES NO | |
| FAILURE MODE-LEAK EXTERNAL. MEASUREMENT P14T INDICATED 90 TO 70 DGF LOWER THAN NORMAL ENGINE COMPARTMENT TEMPERATURE AT 5000. SENSING LINE FOR SUSTAINER FUEL PUMP DISCHARGE PRESSURE TRANSDUCER INDICATED A FROZEN CONDITION AFTER 193.4 SECONDS. | | | | | | |
| SYSTEM EFFECT-NONE. THE AMOUNT OF LIQUID LOST IN THIS CASE, HOWEVER, HAD NO EFFECT ON SYSTEM PERFORMANCE. | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | |
| CORRECTIVE ACTION-INVESTIGATING POSSIBILITY OF INSULATING CRITICAL HYDRAULIC AND FUEL LINES IN THRUST SECTION. ALSO SEVERAL MODIFICATIONS TO ENGINE HARDWARE MADE TO ELIMINATE SOURCE OF CRYOGENIC LEAKAGE. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | FR69M-2683.4 BOOSTER LOX START NOSE ASSY | UTP-PRT 27-02173-801 | 840610 | FACTORY | NO FLEX METAL NO 10070 | |
| FAILURE MODE-OUT OF TOLERANCE. WITH THE TEST SPECIMEN PRESSURIZED TO 800 PSIG USING LINE THE FORCE REQUIRED TO DEFLECT POINT F WAS 110 POUNDS VS 80 POUNDS ALLOWABLE. REF. S/N 318-0119 T.H. NO. H-44922-1. | | | | | | |
| CORRECTIVE ACTION-NONE. THE TEST FIXTURE IMPOSED IMPROPER RESTRAINTS ON THE CENTER OF THE NOSE FLEX SECTION WHICH G | | | | | | |

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|--------------------------------------|---|----------------------------------|----------------------|-------------------|-------------------------------|-------------------------------|
| | AVE READINGS AT LEAST TWICE THE AMOUNT THEY SHOULD HAVE BEEN. REF. RTE 27-02173-801-88 OCT 1964. | | | | | 092323 |
| PROPULSION INTERFACE-A/B LOX FEED | A1-4MO-02-243 Y-DUCT, BC33 | COMPOSITE-FRD/DPL 7-83205-821 | 243D 840809 | A-1/MTR | YES NO | 096599 |
| | FAILURE MODE-LEAK-EXTERNAL. LOX Y-DUCT LEAKING AT P10217 INSTRUMENTATION 8008. | | | | | |
| | SYSTEM EFFECT-NONE. | | | | | |
| | VEHICLE EFFECT-COMPOSITE DELAYED. | | | | | |
| | CORRECTIVE ACTION-LOX Y DUCT REPLACED. | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A3338 DO-SITER LOX START HOSE ASSY | UTP-PET 27-02173-5 | 840809 | FACTORY | YES FLEX METAL NO W5488-5P | 092324 |
| | FAILURE MODE-LEAK EXTERNAL. DURING PET Y AXIS VIBRATION WITH UNIT PRESSURIZED TO 800 PSIG WATER FOLLOWING X AND Z AXIS VIBRATION AT 95 CPS, THE HOSE BEGAN TO LEAK THROUGH THE FLEX SECTION ON THE INSIDE RADIUS NEAR THE SHORT SOLID T O BE. REF. 3/N 403-0182 T.H. NO. 1. | | | | | |
| | CORRECTIVE ACTION-STOP TESTING. REJECT LOT BACK TO VENDOR. REF. IR NO 964981, FPR NR P 5110 SMT AND FPR NO. FR 654-2-108. | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | SLY-9D-06-284P V/E SUPPLY LINE E' BOX B-NUT | FAR 69-22124-5 | 7101 840606 | 2-4/PALC | YES 50/C NO | 096197 |
| | FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR A B-NUT SEIZING ON THE ELBOW. CAUSE OF SEIZURE WAS SEVERE GALLING OF THE NUT AND ELBOW BEARING SURFACES DUE TO THE LACK OF LUBRICATION. 1 OTHER CASE REPORTED ON FAR SLY-9D-06-280F. | | | | | |
| | CORRECTIVE ACTION-LUBRICATION REPORT AND AFFECTED DRAWINGS REVISED TO ADD LUBRICATION REQUIREMENTS FOR THE ABOVE PARTS, TO BE APPLIED PRIOR TO INSTALLATION. | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A1-4MO-01-243 DUCT | COMPOSITE-FRD/DPL 7-83205-821 | 243D 840802 | A-1/MTR | YES NO | |
| | FAILURE MODE-STRUCTURAL. LOX Y-DUCT WAS DAMAGED. | | | | | |
| | SYSTEM EFFECT-LOSS OF STRUCTURAL INTEGRITY. | | | | | |
| | VEHICLE EFFECT-NONE. (DUCT DAMAGE WAS DISCOVERED AFTER DPL). | | | | | |
| | CORRECTIVE ACTION-UNKNOWN DAMAGE BELIEVED TO BE CAUSED BY AIRBORNE FILL AND DRAIN VALVE AND TOPPING VALVE OPENING A | | | | | |

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|---|--|--------------------------------|--------------------------|------------------|------------|-------------------------------|--------|
| NO CLOSING SEQUENCE RELATIVE TO EACH OTHER CAUSING RAM EFFECT IN DUCT DURING TOPPING FOR EXTENDED TIME. | | | | | | | 098601 |
| PROPULSION INTERFACE-A/B LOX FEED | 27A3480 LOX FILL AND DRAIN VALVE, SEAL | UTP-PET 27-02102-23 | 640508 | FACTORY | YES | STRATOS NO 59-460 | 091601 |
| FAILURE MODE-INTERNAL LEAK. DURING THE 195TH PET LIFE CYCLE THE OPEN BUTTERFLY BLADE VALVE SEAL ACCIDENTLY TOUCHED ITS MATING NOZZLE. RESULTANT LEAKAGE PAST THE BLADE VALVE WAS 11 SCIM WITH 2 PSIG HELIUM GAS AND 55 SCIM WITH 20 PSIG. NO GAS LEAKAGE WAS VISIBLE AT PRESSURES UP TO 120 PSIG. AT 175 LIFE CYCLES LEAKAGE HAD DECREASED TO 2.9 SCIM WITH 2 PSIG HELIUM GAS AND 30 SCIM WITH 20 PSIG GNE. REF. S/N 403-3204 T.M. NO. 2. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A3480 LOX FILL AND DRAIN VALVE SWITCH | UTP-PET 27-02102-23 | 640422 | FACTORY | YES | STRATOS NO 59-460 | 092434 |
| FAILURE MODE-ERRATIC OPERATION. DURING THE ELEVENTH PET LIFE CYCLE AT 0 DEGREES LATERAL MISALIGNMENT, POSITION, WITH VALVE FILLED WITH LNE AND PRESSURIZED TO 60 PSIG, THE MICROSWITCH INDICATING VALVE POSITION OPERATED INTERMITTENTLY AND CONTINUED THROUGHOUT THE REMAINING LIFE CYCLES. REF. S/N 403-3204 T.M. NO. 1. | | | | | | | |
| CORRECTIVE ACTION-NONE. REF. FPR NR F-5102 SMT. (LOT 8). | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A3480 LOX FILL AND DRAIN VALVE, SEAL | UTP-PET 27-02102-23 | 640422 | FACTORY | YES | STRATOS NO 59-460 | 091600 |
| FAILURE MODE-LEAK-EXTERNAL. DURING THE FOURTH PET LIFE CYCLE AT 50 DEGREES LATERAL MISALIGNMENT POSITION INTERMITTENT EXTERNAL LNE LEAKAGE WAS NOTED PAST THE PROBE LIP SEAL (BUTTERFLY SEAL). VALVE WAS FILLED WITH LNE PRESSURIZED TO 60 PSIG. LEAKAGE CONTINUED FOR REMAINDER OF LIFE CYCLES. REF. S/N 403-3204 T.M. NO. 1. | | | | | | | |
| CORRECTIVE ACTION-NONE. REF. FPR NR F-5012 SMT (LOT 8). | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 8LV-A0-06-27AF VALVE-FILL AND DRAIN, SWITCH | FAR 27-02102-23 | 7101 | FACTORY | YES | STRATOS NO | 093140 |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR FAILURE TO CLOSE DURING CHECKOUT. PROBLEM CAUSED BY A LIMIT SWITCH WHICH CONTAINED BURNED CONTACTS AND CRACKED CASE SPRING DIAPHRAGMS. | | | | | | | |
| CORRECTIVE ACTION-NONE, AS RESULT OF THIS FAILURE. FURTHER ANALYSIS OF THIS SWITCH WILL BE MADE AS REQUIRED. | | | | | | | |

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15 JUN 1966

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO | |
|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | A-JA-08-2721 FILL AND DRAIN VALVE ACTUATOR | FAR 27-02102-23 | 840317 | FACTORY | YES | STRATON | 898137 |
| FAILURE MODE-FAIL DURING OPERATION. UNIT REJECTED WHEN IT FAILED TO OPERATE UPON INSTALLATION ON A VALVE AT THE GO/ C PRODUCT SUPPORT CENTER. FAR WAS NOT FINALIZED. | | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-19-08-270P LOX FILL AND DRAIN VALVE, SWITCH | FAR 27-02102-23 | 77E 840310 | FACTORY | YES | STRATON | 898998 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. VALVE FAILED TO CLOSE WHEN ENERGIZED. FAILURE CONFIRMED AND ISOLAT ED TO ACTUATOR CLOSING CIRCUIT LIMIT SWITCH. SWITCH FAILURE ATTRIBUTED TO SPRING PLATE AND LEAF SPRING BEING UNDERAC ED AND SOFT. | | | | | | | |
| CORRECTIVE ACTION-RARA-99-06-3697 ISSUED REQUESTING VENDOR CORRECTIVE ACTION IN PROBLEM AREA. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | CT-98-06-095C STAGING VALVE T BOLT | FAR | 135D 840218 | 38A/ETR | YES | THOROL | 898164 |
| FAILURE MODE-STRUCTURAL-CLAMP REJECTED FOR A BENT T BOLT, CAUSED BY OVERTORQUING. FAILURE ANALYSIS WAIVED BY CENTAU R RELIABILITY. SIMILAR CASE REPORTED ON FAR CT-98-06-096C. | | | | | | | |
| CORRECTIVE ACTION-NONE. FAILURE ANALYSIS WAIVED. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-98-06-285F LOX FILL AND DRAIN VALVE, SHAFT | FAR 27-02102-23 | 88F 840213 | WALKER | NO | STRATON | 894276 |
| FAILURE MODE-STRUCTURAL-UNIT RECEIVED SUBSEQUENT TO LOSS OF VEHICLE. FAILURE OF ACTUATOR SHAFT CONCLUDED TO BE BECO MADARY FAILURE AS RESULT OF UNIDENTIFIED OBJECT STRIKING THE ACTUATOR CONTROL MECHANISM COVER DURING THE XPLOSION. TH EREBY CAUSING THE VALVE ACTUATOR ASST TO PIVOT ON ITS SUPPORTS WITH RESULTANT STRUCTURAL FAILURE. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |

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|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B LOX FEED | 89F1983-1 LOX MANUAL PRE-VALVE, SEAL | UTP-PRT 27-02231-3 | 840213 | FACTORY | NO | B.M. MADLEY NO 10713-3 |
| FAILURE MODE-OUT OF SPECIFICATION. DURING THE POST FLOW PROOF CYCLE THE VALVES WERE FOUND TO LEAK 8000 CC/MIN AT 50 PSI. EXAMINATION SHOWED THE BUTTERFLY SEAL HAD BEEN NICKED BY CONTACT WITH THE TEST SET-UP DUCTING. THIS WAS NOT A SPECIMEN FAILURE. MAX ALLOWABLE LEAKAGE IS 100 CC/MIN AT 50 PSI. | | | | | | |
| CORRECTIVE ACTION-STOP THE TEST AND ELIMINATE THE INTERFERENCE OF THE TEST DUCTING. VALVE RETURNED TO VENDOR FOR REPAIR AND REPLACEMENT. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 89A1983 LOX MANUAL PRE-VALVE | UTP-PRT 27-02231-3 | 840218 | FACTORY | YES | B.M. MADLEY NO 10713-3 |
| FAILURE MODE-OUT OF TOLERANCE. AT 7000 GPM THE VALVE BUTTERFLY SHAFT FLUTTERED 0.25 DEGREES. MAX FLUTTER ALLOWED IS NONE. THE BUTTERFLY WAS LOCKED IN THE OPEN POSITION FOR THE AMBIENT DYNAMIC PULL CHECK. | | | | | | |
| CORRECTIVE ACTION-ECP 7856, APPROVED 4-18-65, CHANGES THE SPECIFICATION. FLUTTER UP TO 0.41 DEGREES IS PERMITTED. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-98-06-261F LOX FILL AND DRAIN VALVE, SWITCH | FAR 27-02102-23 | 840120 | SE | ETR | YES STRATON NO 58-480 |
| FAILURE MODE-FAIL DURING OPERATION. BOTH OPEN AND CLOSED POSITION INDICATOR LIGHTS WERE LIT, WITH VALVE IN OPEN POSITION. FAILURE ATTRIBUTED TO MARGINAL SWITCH UTILIZATION. SWITCH ADVERSELY AFFECTED BY TEMP BELOW PLUS 50 DEGREES F. | | | | | | |
| CORRECTIVE ACTION-ECP 7830 APPROV REPLACING HAYDON POSITION INDICATING SWITCH P/N 8146 WITH P/N 8107 DEEMED MORE SUITABLE FOR THE OPERATIONAL ENVIRONMENT. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-98-06-260F LOX FILL AND DRAIN VALVE | FAR 27-02102-23 | 840120 | ETR | YES | STRATON NO 58-480 |
| FAILURE MODE-CONTAMINATION. CORROSION EVIDENT DURING VALVE INSTALLATION AT COMPLEX 11. PROBLEM CONFIRMED. PRODUCT IS 8 ALUMINUM OXIDE. TIME OF OCCURRENCE AND ORIGIN OF CONTAMINATION UNDETERMINED. | | | | | | |
| CORRECTIVE ACTION-AMR PERSONNEL ADVISED TO SURVEIL FOR CORROSION ON CONTINUING BASIS. | | | | | | |

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|---|---|--------------------------------|---------------------|------------------|------------|------------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | A-98-08-259F CHECK VALVE, SEAL, VERNIER ENGINE SUPPLY | FAR 27-02405-1 | SE 640119 | ETR | YES NO | PARKER 1111-595729 | 998042 |
| FAILURE MODE-LEAKAGE EXTERNAL, LEAKAGE AT CHECK VALVE/MANIFOLD INTERFACE DURING CHECK OUT TO T/P 27-95922 AT COMPLE X 11. UNKNOWN AMOUNT OF LEAKAGE. FAILURE NOT CONFIRMED BUT SPECIFIC CAUSE UNDETERMINED. PROBABLE CAUSE WAS INADEQUAT E SPECIFIED ASSY TORQUED TO INSURE R-SEAL INTEGRITY. | | | | | | | |
| CORRECTIVE ACTION-OSTECP 8041 RELEASED TO INCREASE INTERFACE ASSY TORQUE FROM 250 IN-LBS. TO 420 IN-LBS. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 69A3027.1 LOX STAGING DISCONNECT VALVE | UTP-PET 27-02247-1 AND -3 | 640110 | FACTORY | YES NO | THICKOL 310722T AND 31 0723V | 961701 |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE EIGHTH OF 20 PET PROOF CYCLES IN LIFE TEST THE ENGAGED AND MISALIGNED TES T SPECIMEN LEAKED 1.15 SCIM PAST THE ENGAGEMENT SEAL WHILE PRESSURIZED TO 8 PSIG GHE AND 11.3 SCIM. THE VALVE ASSEMB LY O-RING WAS FOUND TO BE MISSING ALLOWING EXCESSIVE LEAKAGE WHEN MATED. REF. S/N 307-1607/307-1113. T.N. NO. 2. | | | | | | | |
| CORRECTIVE ACTION-NONE. ADDITIONAL PRECAUTIONS WERE TAKEN TO INSURE THAT THE O-RING IS PROPERLY INSTALLED PRIOR TO EACH CYCLE. REF. FPR NR F-5045-ST. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 69A3027.1 LOX STAGING DISCONNECT VALVE SEAL | UTP-PET 27-02248-1 AND-3 | 640108 | FACTORY | YES NO | THICKOL 310722T AND 31 0723V | 992337 |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE SIXTH OF 20 PET PROOF CYCLES IN LIFE TEST, THE ENGAGED AND MISALIGNED TES T SPECIMEN LEAKED 4 SCIM PAST THE ENGAGEMENT SEAL WHILE PRESSURIZED TO 20 PSIG AMBIENT GHE. ALLOWABLE LEAKAGE IS 1.5 CIM. REF. S/N 307-1607/307-1113 T.N. NO. 1. | | | | | | | |
| CORRECTIVE ACTION-NONE. REF. F AND CD 964487 AND 964488, FPR NR F-5045 ST AND FPR NO. FR 634-E-116. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 69A2568.3 SUSTAINER LOX START LINE | UTP-QUAL/PPT 27-02168-3 | 631220 | FACTORY | YES NO | FLEXMETAL 10071 | 992327 |
| FAILURE MODE-LEAK EXTERNAL. DURING PPT LIFE TEST SPECIMEN LEAKED AT A SOLID-FLEX JUNCTION FOLLOWING 12,800 FLEX CYC LES WITH GHE AND 3000 FLEX CYCLES WITH LNE. 800 LNE CYCLES REMAINED IN THE TEST FOR COMPLETION. REF. S/N 318-0119 T. N. NO 2. | | | | | | | |
| CORRECTIVE ACTION-STOP TEST. AN ERROR IN CONDUCTING THE TEST MAY HAVE INDUCED FATIGUE FAILURE. PART ACCEPTED AS PAS SING PPT. REF. FPR NR F-5022ST AND FPR NO 634-E-100. | | | | | | | |

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME YENDOR PART NO |
|---|---|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B LOX FEED | A-99-06-252F LOX FILL AND DRAIN VALVE | PAR 27-02102-23 | 74E 631209 | FACTORY | YES | STRATOS NO 59-480 |
| FAILURE MODE-INTERNAL LEAK-LEAKAGE WAS DISCOVERED DURING T/P 27-92339-1. QUANTITY UNKNOWN. FAILURE NOT CONFIRMED. | | | | | | |
| CORRECTIVE ACTION-RAR A-99-06-3640 INITIATED REQUESTING VENDOR TO INVESTIGATE CLEANING PROCEDURE. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-99-06-250-F LOX FILL AND DRAIN VALVE, SWITCH | PAR 27-02102-23 | 74E 631206 | FACTORY | YES | STRATOS NO 59-480 |
| FAILURE MODE-ELECTRICAL OPEN. DURING CHECKOUT, THE OPEN POSITION SWITCH REMAINED OPEN AT ALL TIMES. CLOSE POSITION SWITCH FUNCTIONED NORMALLY. FAILURE DUE TO LOOSE SOLDER CONNECTION. INADEQUATE WETTING WITH RESULTANT DEFECTIVE BOND CONSIDERED PRIMARY CAUSE. | | | | | | |
| CORRECTIVE ACTION-RAR A-99-06-3674 DATED 8 JAN 1984 DIRECTED TO VENDOR TO REVIEW APPLICABLE SOLDERING METHODS AND PROCEDURES. VENDOR CORRECTIVE ACTION DOCUMENTED IN VCAR 3802-84. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 59A2606-2 SUSTAINER LOX START LINE | UTP-QUAL/PPT 27-02160-3 | 631123 | FACTORY | YES | FLEXMETAL NO 10071 |
| FAILURE MODE-LEAK EXTERNAL. DURING PPT LIFE TEST WITH THE TEST SPECIMEN PRESSURIZED TO 1300 PSIG GAGE, THE OBTUSE-ANGLE END OF THE CENTER FLEX SECTION LEAKED 98 SCCM. FAILURE OCCURRED DURING FIRST LIFE CYCLE. REF. S/N 309-0112 T.M. NO. 1. | | | | | | |
| CORRECTIVE ACTION-STOP TEST. REJECT SPECIMEN AND SUBMIT TO FAILURE ANALYSIS. VENDOR FABRICATION TECHNIQUE REVISED TO PRECLUDE ADDITIONAL FAILURE. REVISED SPECIMEN TO BE RETESTED. REF. PPR NRP-301187 AND PPR NO PPR54-2-064. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A2124-3 LOX FILL AND DRAIN VALVE SEAL | UTP-PCT 27-02102-23 | 631121 | FACTORY | YES | STRATOS NO 59-480 |
| FAILURE MODE-STRUCTURAL. DURING PET LIFE CYCLE 50, THE BLADE VALVE LIP SEAL FAILED AT THE 200 DEGREE LATERAL MISALIGNMENT POSITION, WITH A 2 IN BY 1/4 IN SECTION OF THE LIP SEAL BEING DETACHED. REF. S/N 305-3071 T.M. NO 2. | | | | | | |
| CORRECTIVE ACTION-TERMINATE TESTING. LIP SEAL MATERIAL CHANGED FROM KEL-P-81 TO PLANKON CTFE 2400 BY ECP 7930 (CHAN 400 FROM -25 TO -35). REF. PPR NO P-9025 SUT AND PPR NO PPR54-2-075. | | | | | | |

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|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | 99A2888.1 SUSTAINER LOX START LINE | UTP-QUAL/PPT 27-02166-3 | 83115 | FACTORY | YES | FLEXMETAL NO 10071 | 992329 |
| FAILURE MODE-LEAK-EXTERNAL. DURING PPT LIFE TEST, SPECIMEN LEAKED AFTER 65 FLEX CYCLES WITH LME PRESSURIZED TO 750 PSIG. REF. S/N 309-0114 T. H. NO. 1. | | | | | | | |
| CORRECTIVE ACTION-REJECT SPECIMEN. STOP TEST, OBTAIN REPLACEMENT SPECIMEN. VENDOR TO REVISE FABRICATION TECHNIQUES. REF. FPR MRF-3009 ST AND FPR NO. FR634-2-064. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 27A2124-3 LOX FILL AND DRAIN VALVE SWITCH | UTP-PET 27-02102-23 | 83114 | FACTORY | YES | STRATOS NO 59-480 | 992436 |
| FAILURE MODE-ERRATIC OPERATIC. DURING PET LIFE CYCLE THE MICROSWITCH INDICATING VALVE POSITIONS (OPEN OR CLOSED) OF ERATED INTERMITTANTLY. REF. S/N 302-3071 T.H. NO 1. | | | | | | | |
| CORRECTIVE ACTION-AN IMPROVED POSITION SWITCH IS BEING INCORPORATED ON ALL FUTURE PRODUCTION, BY THE VENDOR. REF. FPR NR F-3023 SWT AND FPR NO FR 634-2-073. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-98-06-256F CHECK VALVE/VERNIER ENGINE SUPPLY | FAR 27-02403-1 | 136F 831028 | ETR11 | YES | PARKER NO 1111-995729 | 999006 |
| FAILURE MODE-STRUCTURAL, MAINLINE CRACK IN BODY OF UNIT AT JUNCTION WITH SEALING SURFACE CRACK EXTENDED HALFWAY THRU OUGH VALVE BODY. ATTRIBUTED TO STRESS CORROSION. FAILURE UNCOVERED DURING INSPECTION SURVEY 120 AT COMPLEX 11. FAR A -99-06-218 DISCUSSES SIMILAR FAILURE. | | | | | | | |
| CORRECTIVE ACTION-NONE AS DIRECT RESULT OF THIS REPORT. VALVE PREVIOUSLY REDESIGNED TO -3 CONFIGURATION PER ECP 037 8401, CIC 06401, TO ELIMINATE THIS TYPE FAILURE MODE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 69F1983-1 LOX MANUAL PRE-VALVE | UTP-PRT 27-02231-3 | 10713-3 831023 | FACTORY | YES | HADLEY NO | 991843 |
| FAILURE MODE-OUT OF TOLERANCE. DURING A PROOF CYCLE AFTER THE VIBRATION SNEEP, INTERNAL LEAKAGE AT 50 PSIG MEASURED 3000 CC/MIN. MAX ALLOWED LEAKAGE AT 50 PSIG IS 1000 CC/MIN. LEAKAGE WAS ATTRIBUTED TO THE SCRAPER RING SCRAPING THE DRY FILM LUBRICANT FROM THE VALVE BODY, WHICH PREVENTED THE SEAL FROM SEATING. | | | | | | | |
| CORRECTIVE ACTION-NONE. STOP TESTING. | | | | | | | |

13 JUN 1988

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|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | 69A1956 LOX FILL AND DRAIN VALVE | UTP-SLT 27-02102-23 | 931018 | FACTORY | YES | STRATOS NO 59-460 | 091689 |
| FAILURE MODE-OUT OF TOLERANCE. DURING PROOF CYCLE FOLLOWING SLT VIBRATION WITH THE VALVE FULL OF LNE AT 35 PSIG THE VALVE DID NOT CLOSE UNTIL THE SECOND TRIAL DURING WHICH RESPONSE TIME WAS 8.7 SECONDS VS 5 SECONDS ALLOWED. CORROSION ON BUTTERFLY SHAFT CAUSED VALVE TO STICK. REF. S/N 207-3031 T.H. NO. 4. | | | | | | | |
| CORRECTIVE ACTION-ECP7589 TO CORRECT PROBLEM DISAPPROVED. TESTING DISCONTINUED. HARDWARE ACCEPTABLE FOR LIMITED FL16 MT USE. REF. RTN NR P-4040-ST AND FRR NO. FR 654-2-032. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | LV-A9-06-249F SUSTAINER OXIDIZER NOSE, FLARE | FAR 27-02138-801 | 1480 931010 | FACTORY | YES | WEATHERHEAD NO | 091617 |
| FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR LEAKAGE AT FITTING FERRULE. CAUSE WAS PITTING OF THE FLARED BEATING SURFACE AS RESULT OF AN UNDETERMINED CORROSIVE ELEMENT. | | | | | | | |
| CORRECTIVE ACTION-NONE. VENDOR NOTIFIED OF FAILURE AND RESULTS OF INVESTIGATION. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-95-06-244F FILL AND DRAIN VALVE SWITCHES | FAR 27-02102-23 | 3E 931009 | FACTORY | YES | STRATOS NO | 093889 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UNIT REJECTED FOR FAILURE OF VALVE POSITION SWITCHES TO FUNCTION. THE VALVE-CLOSED SWITCH CONTACTS WERE WELDED TOGETHER-AND, THE VALVE-OPEN SWITCH CONTACT HOLDER LEAF SPRING WAS MELTED THROUGH. ABOVE WAS CAUSED BY AN APPLICATION OF EXCESS CURRENT TO THE SWITCHES. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 69A1956 LOX FILL AND DRAIN VALVE | UTP-PRT 27-02102-23 | 931009 | FACTORY | YES | STRATOS NO 59-460 | 091688 |
| FAILURE MODE-OUT OF TOLERANCE. DURING PROOF CYCLE FOLLOWING PRT SINE VIBRATION, THE VALVE WOULD NOT CLOSE UNTIL THE FOURTH TRY. THE CLOSING TIME WAS 9.8 SECONDS (5 SECONDS ALLOWABLE) WITH A STARTING CURRENT GREATER THAN 10 AMPS. COARSION ON BUTTERFLY SHAFT CAUSED VALVE TO STICK. REF. S/N 207-3031 T.H. NO. 2. | | | | | | | |
| CORRECTIVE ACTION-ECP 7589 TO CORRECT PROBLEM DISAPPROVED. TESTING DISCONTINUED. REF. RTN NR P-4036 ST AND FRR NO. FR 654-2-032. | | | | | | | |

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|--|---|--------------------------------|---------------------|------------------|--------------------------|-------------------------------|
| PROPULSION INTERFACE-A/B LOX FEED | TP-89A1863-1 LOXMANUALPRE-VALVE,BOLT | UTP-PRT 29-02251-3 | 630912 | FACTORY | YES B.H. MADLEY NO | |
| FAILURE MODE-STRUCTURAL. ONE OF THE FOUR LOCKING BOLTS SEIZED WHILE BEING REMOVED PRECEDING A PROOF CYCLE. | | | | | | |
| CORRECTIVE ACTION-REMOVE SEIZED BOLT AND CONTINUE TESTING WITH THREE BOLTS. BOLTS AND HOUSING ARE STEEL. NO LUBRICATION WAS CALLED OUT. DRY-LUBED BOLTS WILL BE USED IN FUTURE. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-99-06-23VF FILL AND DRAIN VALVE-ACTUATOR | FAR 27-02102-23 | 113F 630621 | FACTORY | YES STRATOS NO 59-480 | |
| FAILURE MODE-FAIL TO OPERATE. UNIT REJECTED FOR FAILURE OF VALVE OPEN POSITION SWITCH TO FUNCTION. REASON FOR MALFUNCTION WAS IMPROPER ADJUSTMENT OF THE ACTUATOR TRAVELER RESULTING IN INSUFFICIENT MOVEMENT TO ACTUATE THE SWITCH. | | | | | | |
| CORRECTIVE ACTION-VENDOR PERSONNEL WERE INSTRUCTED TO EXERCISE GREATER CARE IN ADJUSTING THE ACTUATORS. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-99-06-239F FILL AND DRAIN VALVE SWITCH | FAR 27-02102-23 | 109F 630621 | FACTORY | YES STRATOS NO 59-480 | |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UNIT REJECTED FOR FAILURE OF THE VALVE-CLOSED LIGHT TO FUNCTION. SHIFTING OF THE FIBER GLASS INSULATOR, BETWEEN THE LEAF SPRING PIVOT PLATE AND THE NORMALLY OPEN CONTACT HOLDER SUSPECTED AS CAUSE OF FAILURE. | | | | | | |
| CORRECTIVE ACTION-VENDOR DID NOT CONCUR WITH ABOVE FAILURE CAUSE, BUT ADVISED THE FIBER GLASS INSULATOR HAD BEEN CHANGED TO CERAMIC. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 89F-1963-1 LOXMANUALPRE-VALVE,SEAL | UTP-PRT 27-02251-3 | 630730 | FACTORY | YES B.H. MADLEY NO | |
| FAILURE MODE-LEAK, EXTERNAL. INTERNAL LEAKAGE PAST THE BLIND END SHAFT SEAL OF THE BUTTERFLY SHAFT. LEAKAGE IN EXCESS OF 3000 CC/MIN (0.1 CC/MIN ALLOWED). LEAKAGE OCCURRED UNDER A STATIC PRESSURE OF 126 PSIG. EXAMINATION BY THE VENDOR SHOWED THAT IN ONE AREA THE TEFLON SEAL HAD TAKEN A PERMANENT SET. THE DEFORMATION WAS CAUSED BY THE SEAL INSTALLATION TECHNIQUE. | | | | | | |
| CORRECTIVE ACTION-THE SEAL WAS REPLACED AND THE UNIT WAS RETURNED TO TEST. | | | | | | |

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|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | 89F1908-1 LOX START TANK FILL HOSE ASSY | UTP-SLT 27-02249-1 | 830716 | FACTORY | YES NO | FLEX METAL HOSE MS 578-1 | 891839 |
| FAILURE MODE-LEAK, EXTERNAL. THE LEAKAGE OCCURRED AT A POINT WHERE THE FLEXIBLE BRAID JOINS THE RIGID TUBING. HOSE WAS BEING VIBRATED AT 8 CPS WITH A PRESSURE OF 140 PSIG AT 300 DEG F. THE UNIT WAS SPURTING LIQUID NITROGEN. SPECIFICATION STATES THERE SHALL BE NO EXTERNAL LEAKAGE. | | | | | | | |
| CORRECTIVE ACTION-STOP TEST. ECP 7580 REPLACES THE EXISTING STRIP-WOUND HOSE WITH ONE OF ANNULAR BELLOWS CONSTRUCTION. ECP WAS APPROVED ON JANUARY 28, 1964. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 89F1908-1 LOX START TANK FILL HOSE ASSY | UTP-PRT 27-02249-1 | 830716 | FACTORY | YES NO | FLEX METAL HOSE MS 578-1 | 891836 |
| FAILURE MODE-LEAK-EXTERNAL. THE LEAKAGE OCCURRED AT A POINT WHERE THE FLEXIBLE BRAID JOINS THE RIGID TUBING. HOSE WAS BEING VIBRATED AT 5 CPS WITH A PRESSURE OF 140 PSIG AT 300 DEG F. THE UNIT WAS SPURTING LIQUID NITROGEN. SPECIFICATION STATES THERE SHALL BE NO EXTERNAL LEAKAGE. | | | | | | | |
| CORRECTIVE ACTION-STOP TEST. ECP 7580 REPLACES THE EXISTING STRIP-WOUND HOSE WITH ONE OF ANNULAR BELLOWS CONSTRUCTION. ECP WAS APPROVED ON JAN 28, 1964. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | SP-49-08-238F PREVALVE HANDLE LOCKING BOLT | FAR | 1260 830702 | FACTORY | YES NO | | 492094 |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR FAILED BOLT AS A RESULT OF OVERTORQUING. | | | | | | | |
| CORRECTIVE ACTION-60/C FACTORY PERSONNEL INFORMED OF FAILURE AND INSTRUCTED TO PROPERLY TORQUE BOLTS. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | SP-49-08-231C BOOSTER STAGING VALVE SHAFT-SEAL | FAR 27-83519-803 | 24E 830517 | FACTORY | YES NO | 60/C | 494315 |
| FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR LEAK FROM THE SHAFT SEAL. NO FAILURE ANALYSIS PERFORMED. PART NEVER RECEIVED. | | | | | | | |
| CORRECTIVE ACTION-NONE. NO FAILURE ANALYSIS PERFORMED. | | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REVIEW-PROPOSITION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | URI OTH | VENDOR NAME VENDOR PART NO |
|---|---|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B LOX FEED | A-99-08-218F VALVE, CHECK, V/E SUPPLY | FAR 27-02403-1 | 24E 630516 | WTR | YES NO | PARKER |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR A CRACKED VALVE BODY. FAILURE CONFIRMED AND ATTRIBUTED TO STRESS CORROSION OF THE ALUMINUM ALLOY MATERIAL. | | | | | | |
| CORRECTIVE ACTION-ECF8401 INITIATED PROPOSING WELDED VALVE BODY HALVES AND USE OF 6061-T6 ALUMINUM ALLOY MATERIAL. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | SP-90-08-215F VALVE-FILL AND DRAIN | FAR 27-02102-23 | 190D 630511 | 2-3/PALC | NO | STRATON |
| FAILURE MODE-FAIL DURING OPERATION-UNIT REJECTED FOR FAILING TO FULLY OPEN. FAILURE CONFIRMED AND ATTRIBUTED TO VALVE BODY BUCKLING. THE LATTER WAS THE RESULT OF MANUALLY OVERRIDING A LOAD-CONTROL FAILURE WHICH RESULTED IN A SLUG OF FLOX HITTING THIS VALVE WHILE IT WAS OPENING. THIS SUDDEN APPLICATION OF FORCE ON THE BUTTERFLY BUCKLED THE VALVE BODY WHICH STOPPED BUTTERFLY TRAVEL. | | | | | | |
| CORRECTIVE ACTION-LOX LOADING LOGIC WAS REVISED PER ECF7365. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-86-08-214F Y-DUCT ASSEMBLY BELLONS | FAR 27-83321-813 | 75F 630430 | 8YC | YES NO | 60/C |
| FAILURE MODE-LEAK-EXTERNAL-UNIT REJECTED FOR SUSPECTED EXTERNAL LEAK IN DUCT BELLONS. LEAKAGE NOT CONFIRMED. IT IS POSSIBLE LEAK ORIGINATED AT FLANGED CONNECTION. | | | | | | |
| CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-99-08-3130F TOPPING LINE ELBOW | FAR 27-83363-7 | 110F 630426 | FACTORY | YES NO | 60/C |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR A FAILED MOUNTING BOLT. CAUSE WAS CONSIDERED THE RESULT OF AN OVERSIZED TAPPED HOLE AND THE BOLT BEING MISALIGNED IN THE HOLE. THE EFFECT WAS THAT OF CROSS THREADING AND APPLICATION OF INSUFFICIENT TORQUE TO SHEAR THE BOLT. | | | | | | |
| CORRECTIVE ACTION-FACTORY PERSONNEL WERE INSTRUCTED TO USE PROPER SIZE TAPS AND DRILLS. | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO | |
|--|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | SP-99-06-229F BOOSTER PROP, VALVE HOSE BELLOWS | FAR 27-02184-3 | 830423 | FACTORY | YES | ANACONDA | 894185 |
| FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR AN EXTERNAL LEAK, WHICH ORIGINATED IN A CRACK IN THE BELLOWS SEAM WELD. THE CRACK WAS CONSIDERED THE RESULT OF STRESS CORROSION CAUSED BY RESIDUAL BRAZING FLUX AND FORMING STRESSES. 1 OTHER CASE REPORTED IN FAR 81V-A9-06-203F. | | | | | | | |
| CORRECTIVE ACTION-VENDOR REVISED PROCESSING PROCEDURE TO REMOVE FLUX RESIDUE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-98-06-212F TOPPING LINE | FAR 27-21507-1 | 135F 830418 | ETR | YES | 60/C NO | 894190 |
| FAILURE MODE-STRUCTURAL. TWO LINES REJECTED FOR BEING COLLAPSED. FAILURE CONFIRMED AND ATTRIBUTED TO IMPROPER FABRICATION, HANDLING AND TRANSPORTATION IN THE SOFT RATHER THAN T-6 CONDITION. ADDITIONAL CASE REPORTED ON FAR-A-90-06-236. | | | | | | | |
| CORRECTIVE ACTION-FABRICATION, INSPECTION AND HANDLING TECHNIQUES REVISED TO ALLEVIATE ABOVE PROBLEM. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-99-06-213F VALVE, FILL AND DRAIN, AIRBORNE-SE | FAR 27-02102-829 | 138D 830418 | FACTORY | YES | AIRRESEARCH NO | 894507 |
| FAILURE MODE-LEAK. UNIT REJECTED FOR INTERNAL LEAKAGE, WHICH WAS CONFIRMED AND ATTRIBUTED TO A SURFACE DEFECT IN THE BUTTERFLY SEAL. | | | | | | | |
| CORRECTIVE ACTION-VENDOR PERSONNEL HAVE BEEN CAUTIONED TO EXERCISE GREATER CARE TO PREVENT DAMAGE TO THE SEAL. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | HG-98-06-207F FILL AND DRAIN VALVE | FAR 27-02102-829 | 130D 830321 | ETR | YES | AIRRESEARCH NO | 894505 |
| FAILURE MODE-CONTAMINATION. UNIT REJECTED FOR SIGNS OF CONTAMINATED. CONTAMINATION CONFIRMED AND ATTRIBUTED TO INADEQUATE PACKING AND PACKAGING FOR LONG TIME STORAGE, BY THE VENDOR. | | | | | | | |
| CORRECTIVE ACTION-RECOMMENDED REVISION OF VENDORS CLEANING AND PACKAGING SPECIFICATION AND APPROVAL BY 60/C. SPARE VALVES WERE SURVEYED FOR THIS CONDITION. | | | | | | | |

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO | |
|---|---|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | A-99-08-202F BOOSTER STAGING VALVE | FAR 27-22006-3 | 630226 | FACTORY | YES NO | | 898483 |
| FAILURE MODE-OUT OF TOLERANCE. UNIT REJECTED FOR EXCESSIVE CLOSING TORQUE. FAILURE CONFIRMED AND ATTRIBUTED TO INTERFERENCE BETWEEN BUTTERFLY AND VALVE BODY, DUE TO THE BUTTERFLY NOT BEING CENTERED IN THE VALVE OPENING. 1 OTHER IDENTICAL CASE OF FAR A-99-08-208F. | | | | | | | |
| CORRECTIVE ACTION-NONE. SINCE VALVE WAS TESTED WITH THE ACTUATOR SHAFT IN A VERTICAL POSITION, WHICH IS NOT ITS FLIGHT ATTITUDE. VALVE MECHANISM WAS DESIGNED TO WITHSTAND 2000 IN. LBS., ONLY 120 IN. LBS. REQUIRED TO CLOSE THIS VALVE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-99-08-3102F ELBOW FITTING-TOPPING LINE | FAR 27-23573-7 | 1930 630212 | FACTORY | YES NO | | 897726 |
| FAILURE MODE-LEAK-INTERNAL. THREE UNITS REJECTED FOR EXTERNAL LEAKAGE DURING PRESSURE TEST. ALL UNITS LEAKED WHEN PRESSURIZED WITH HELIUM. CAUSE WAS A CONTINUOUS PATH OF TITANIUM CARBIDES IN THE 321 STEEL, WHICH IS INDICATIVE OF POOR QUALITY BAR STOCK. | | | | | | | |
| CORRECTIVE ACTION-INSPECTION PROCEDURES FOR ULTRASONIC INSPECTION REVIEWED AND CONSIDERED ADEQUATE IF PROPERLY APPLIED. INSPECTION PERSONNEL WERE MADE AWARE OF PROBLEM. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | HG-99-08-189F PREVALVE SEAL | FAR 27-02231-3 | 1320 621210 | FACTORY | YES NO | | 892249 |
| FAILURE MODE-LEAK-UNIT REJECTED FOR INTERNAL AND EXTERNAL LEAKAGE. INTERNAL LEAKAGE ONLY CONFIRMED AND RESULTED FROM A LARGE INDENTATION IN THE TEFLON SEAL ON THE BUTTERFLY. | | | | | | | |
| CORRECTIVE ACTION-NONE. VENDOR DENIED LIABILITY FOR THE SEAL DAMAGE SINCE LEAKAGE WAS WITHIN SPECIFICATION WHEN ACCEPTED. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-99-08-180F STAGING VALVE SEAL | FAR 27-22006 | 79E 621130 | FACTORY | YES NO | | 896192 |
| FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR LEAKAGE AT THE ACTUATOR SHAFT. FAILURE CONFIRMED AND ATTRIBUTED TO A SCRATCHED KEL-F LIP SEAL. 3 ADDITIONAL CASES REPORTED ON FAR A-99-08-210F. | | | | | | | |
| CORRECTIVE ACTION-60/C PERSONNEL INVOLVED IN THE MANUFACTURE OF THE VALVE WERE CAUTIONED TO USE EXTREME CARE IN MACHINING AND INSPECTION OF CRITICAL CHAMFER AND RADIUS AREAS ADJACENT TO THE SEAL. | | | | | | | |

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CONVAIR DIVISION

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF TIME | SITE DIF TIME | PRI OTH | VENDOR NAME VENDOR PART NO | |
|--|---|--------------------------------|--------------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | A-90-08-10FF V/E TUBE B NUT | FAR 27-24008-1 | 83F 021126 | WTR | YES NO | YES DEUTCH | 000240 |
| FAILURE MODE-OUT OF TOLERANCE. UNIT REJECTED FOR A B NUT EXTERIOR PLAM. EXAMINATION REVEALED AN INDENTATION ON A PL AT WHICH OCCURRED PRIOR TO BLUE ANODIZING THE PART. | | | | | | | |
| CORRECTIVE ACTION-NONE, SINCE THE PARTICULAR VENDOR, THE DEUTSCH COMPANY, IS NO LONGER AN APPROVED VENDOR. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-88-06-170F DRAIN TUBE SLEEVE | FAR 27-24011-71 | 75F 021119 | SYC. | YES NO | YES 60/C | 000400 |
| FAILURE MODE-STRUCTURAL-UNIT REJECTED FOR A CRACKED SLEEVE. FAILURE CONFIRMED AND ATTRIBUTED TO USE TYPE 303 STAINLESS STEEL WHICH WILL NOT WITHSTAND HIGH STRESSES IN THE TRANSVERSE DIRECTION. THIS IS IDENTICAL TO THE B-NUT CRACKIN G PROBLEM. SIMILAR CASE REPORTED IN FAR CT-A9-08-120. | | | | | | | |
| CORRECTIVE ACTION-MIL-F-5509A, AMEND. 7, RELEASED JAN. 1963, WHICH ELIMINATES USE OF TYPE 303 STAINLESS STEEL FOR TUBING SLEEVES. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-99-03-174F FILL AND DRAIN VALVE SWITCH | FAR 27-02102-23 | 134F 021116 | FACTORY | YES NO | YES STRATOR | 000220 |
| FAILURE MODE-FAIL DURING OPERATION. UNIT REJECTED FOR INDICATING OPEN AND CLOSED SIMULTANEOUSLY. FAILURE CONFIRMED AND ATTRIBUTED TO VALVE-CLOSED MICROSWITCH, WHICH DID NOT OPEN WHEN THE PLUNGER WAS RELEASED. THIS WAS CAUSED BY EXCESSIVE FRICTION BETWEEN THE RUBBER SEAL AND THE SWITCH PLUNGER. | | | | | | | |
| CORRECTIVE ACTION-VENDOR TO SUBJECT ACTUATORS AND SWITCHES TO ADDITIONAL TESTING PRIOR TO INSTALLATION IN THE VALVE S. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-88-08-173 TOPPING CHECK VALVE | FAR 27-02301-001 | 75F 020327 | SYC | YES NO | YES A. O. LEONARD | 000243 |
| FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR EXTERNAL LEAKAGE. FAILURE CONFIRMED AND ATTRIBUTED TO A CRACK IN THE VALVE BODY DUE TO STRESS CORROSION OF 2024T4 ALUMINUM ALLOY. | | | | | | | |
| CORRECTIVE ACTION-THIS VALVE TO BE REPLACED BY PIN 27-02355-1 WHICH IS MADE OF 6061-T6 ALUMINUM ALLOY, AUTHORIZED BY T OBT ECP8403, A PART OF TC1617. | | | | | | | |

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CONVAIR DIVISION

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM | TEST/REPORT NUMBER | DIP DATA SOURCE | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME |
|---|--|---------------------|------------------|---------------|-----------|-----------------------|
| SUB-SYSTEM | FAILED COMPONENT NAME | PART NUMBER | | | | VENDOR PART NO |
| PROPULSION INTERFACE-A/B LOX FEED | A0J82-0047/P1-804-00-08 PUMP-TURBO | COUNTDOWN | 87 920919 | 11/ETR | YES NO | |
| <p>FAILURE MODE-OUT OF SPECIFICATION. B1 LOX PUMP INLET TEMPERATURE OF -281 DEG F EXCEEDED REDLINE VALUE OF -282 DEG F. CAUSE UNKNOWN.</p> <p>SYSTEM EFFECT-NONE.</p> <p>VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED.</p> <p>CORRECTIVE ACTION-UNKNOWN.</p> | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-88-06-172 A/B TOPPING RIYE-OFF DISCONNECT | FAR 27-21308-11 | 73F 820911 | 8YC. | YES NO | |
| <p>FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR EXTERNAL LEAKAGE PAST THE SEAL. FAILURE CONFIRMED AND ATTRIBUTED TO CORROSION BENEATH THE ANODIC HARDCOATING, WHICH DESTROYED THE PROBE SEALING SURFACE.</p> <p>CORRECTIVE ACTION-CORRECTIVE ACTION PROPOSED BUT REJECTED BY CUSTOMER.</p> | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-90-06-164 STAGINGVALVE, SEAL | FAR 27-22006 | 16F 820830 | FACTORY | YES NO | |
| <p>FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR EXTERNAL LEAKAGE FROM THE ACTUATING SHAFT SEAL CONFIRMED AND ATTRIBUTED TO USE OF TRICHLOROETHYLENE CLEANING SOLVENT AND AN OVEN BAKE.</p> <p>CORRECTIVE ACTION-MPS REVISED TO REQUIRE FREON T-F CLEANING SOLVENT AND AN OVEN BAKE AT 105° INSTEAD OF 250 F TO REDUCE LIP SEAL DAMAGE DURING CLEANING.</p> | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-90-02-020F TORUSEAL-PREVALVE | FAR 94-18013-004 | 620Y30 | WTR | YES NO | ADVANCED PRODU CTS |
| <p>FAILURE MODE-LEAK-EXTERNAL-LEAKAGE BETWEEN MATING FLANGES OF LOX PREVALVE AND THE FILL AID DRAIN LINE AND THE SEALS. FAILURE IS DUE TO CONTAMINATION IN THE FLANGE GROOVES WHICH PREVENTED AN EVEN SEALING SURFACE FOR THE SEAL. THE SEAL IS A METAL O RING SHAPED LIKE A TORUS. IT CONTAINED MANY PIT MARKS AROUND COMPLETE PERIPHERY OF SEAL.</p> <p>CORRECTIVE ACTION-1. GO/A ALERTED FIELD PERSONNEL TO THE HAZARD OF CONTAMINATION AND THE NECESSITY OF CLEANLINESS AT INSTALLATION, PER TMX SANVAN 9-343. 2. FACTORY PERSONNEL WERE ALERTED TO THE HAZARDS, BY AVO ON 11/29/62. 3. DATA WAS TRANSMITTED FOR OPERATIONAL TECHNICAL ORDER USAGE.</p> | | | | | | |

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME C/P | PRI OTH | VENDOR NAME VENDOR PART NO |
|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B LOX FEED | A-98-06-175C V/E CHECK VALVE | FAR 27-0R405-1 | 620722 | WTR | YES NO | PARKER NO |
| FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR LEAKAGE AT UPSTREAM END FITTING. NO FAILURE ANALYSIS PERFORMED SINCE PART WAS REMOVED AT THE PRODUCT SUPPORT CENTER AND RETURNED TO STOCK. | | | | | | |
| CORRECTIVE ACTION-NOT KNOWN. NO FAILURE ANALYSIS PERFORMED. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-9L-05-182 A/B FILL AND DRAIN VALVE MOTOR | FAR 27-02102-23 | 60F 620722 | LAFB | YES NO | STRATON |
| FAILURE MODE-FAIL DURING OPERATION. VALVE REJECTED FOR INTERMITTENT OPERATION. FAILURE CONFIRMED AND ATTRIBUTED TO UNUSUALLY LOW FRICTION AND WINDAGE LOSSES IN THE MOTORS, RESULTING IN LOWER THAN ANTICIPATED POWER CONSUMPTION IN THE NO-LOAD CONDITION. THE ATTENDANT LOW CURRENT WAS INSUFFICIENT TO HOLD THE SPRING-LOADED BRAKE AWAY FROM THE BRAKE DISC. TWO OTHER VALVES FROM SAFB AND BYCAMORE HAD THE SAME PROBLEM, REPORTED IN THIS FAR. | | | | | | |
| CORRECTIVE ACTION-VENDOR REQUESTED TO MAKE A DESIGN CHANGE TO PREVENT RECURRENCE OF THE ABOVE PROBLEM. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-9D-06-152 V/E LINE B-NUT. | FAR 27-24008-11 | 620613 | WTR | YES NO | 60/C |
| FAILURE MODE-LEAK-EXTERNAL UNIT REJECTED FOR EXTERNAL LEAKAGE AT THE FLARED FITTINGS. LEAKAGE CONFIRMED AND ATTRIBUTED TO INSUFFICIENT B NUT TORQUE. | | | | | | |
| CORRECTIVE ACTION-FACTORY PERSONNEL REINSTRUCTED TO COMPLY WITH LUBRICATION AND TORQUE REQUIREMENTS. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A61-0883/P4-401-0D-107 LOX LINE | FLIGHT | 107D QK0324 | 14/ETR 19C | YES NO | |
| FAILURE MODE-EXTERNAL LEAK IN LOX PLUMBING IN VICINITY OF APEX OF FUEL TANK IN QUAD 1. FIRST INDICATED BY A DROP IN MEASUREMENT H52P, V/S HYDRAULIC PRESSURE, CAUSED BY FREEZING OF SENSE LINE. | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | |
| VEHICLE EFFECT-NONE. SENSE LINE TO MEASUREMENT H52P BECAME FROZEN GIVING ERRONEOUS INDICATION OF ZERO V/S SYSTEM HYDRAULIC PRESSURE. ALSO ASIS HYDRAULIC PRESSURE SWITCH NUMBER 2 BECAME FROZEN GIVING ERRONEOUS ABORT SIGNAL. LATTER NOT EFFECTIVE DUE TO REDUNDANCY (SWITCH NUMBER 1 DID NOT GIVE ABORT SIGNAL). | | | | | | |
| CORRECTIVE ACTION-PROPOSED A CHANGE OF INSULATION MATERIALS AND WRAPPING OF SENSE LINES. | | | | | | |

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CONVAIR DIVISION

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

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|--|---|--------------------------------|--------------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B LOX FEED | A-9D-06-200F BOOSTER STAGING VALVE SEAL | FAR 27-22006-3 | 620523 | WTR | NO NO | 099243 |
| FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR EXTERNAL LEAKAGE AT THE ACTUATOR SHAFT SEAL. SEAL REPLACED AT MTR. DI SCREAPANT SEAL RETURNED TO SAN DIEGO. EXAMINATION SHOWED THE SEAL NOT TO BE AT FAULT. | | | | | | |
| CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | HC-9B-08-13B STAGING VALVE, BOLT | TAR 610-4-02-1282 | 107D (20517 | ETR | YES NO | 099221 |
| FAILURE MODE-OUT OF TOLERANCE. UNIT REJECTED FOR HAVING BENT AND DAMAGED THREADS. INVESTIGATION CONCLUDED PROBLEM W AS THE RESULT OF IMPROPER INSTALLATION. | | | | | | |
| CORRECTIVE ACTION-FACTORY PERSONNEL INSTRUCTED TO FOLLOW WPS INSTALLATION INSTRUCTIONS EXACTLY. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-9D-06-128 VALVE CHECK-TOPPING | FAR 27-02501-801 | 67E 620516 | WTR | YES NO | 099230 |
| FAILURE MODE-CONTAMINATION. UNIT REJECTED DURING RECEIVING INSPECTION FOR INTERNAL LEAKAGE, WHICH WAS CONFIRMED IN FAILURE ANALYSIS. LEAKAGE WAS CAUSED BY A METAL PARTICLE EMBEDDED IN THE POPPET SEAL. | | | | | | |
| CORRECTIVE ACTION-REQUESTED WTR TO TAKE ACTION TO INSURE LOX SYSTEM CLEANLINESS. SC REVISED EOP 415-134A TO INCLUDE SPECIFIC REVERSE-FLOW LEAK TESTS, WHICH WAS TO BE PERFORMED ON ALL E AND F MISSILES IN THE FACTORY PRESHIPMENT AREA | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-9N-06-147 A/B FILL AND DRAIN MOTOR | FAR 27-02102-23 | 27F 620514 | AATB | YES NO | 099234 |
| FAILURE MODE-FAIL TO CEASE OPERATION. UNIT REJECTED FOR FAILURE TO CLOSE. FAILURE CONFIRMED AND ATTRIBUTED TO LOW M OTOR STARTING TORQUE CAUSED BY A DIRTY COMMUTATOR. WHEN CLEANED VALVE FUNCTIONED SATISFACTORILY. | | | | | | |
| CORRECTIVE ACTION-VENDOR REQUESTED TO IMPROVE SC DURING REMOVAL OF COMPONENTS TO INSURE INTEGRITY. | | | | | | |

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| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO | |
|--|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | A-88-06-133 FILL AND DRAIN VALVE SWITCH | FAR 27-02108-23 | 820314 | LAFB | YES NO | STRATON | 899227 |
| FAILURE MODE-FAIL DURING OPERATION, UNIT REJECTED FOR FAILURE TO INDICATE VALVE POSITION WHEN AT CRYOGENIC TEMPERATURE. FAILURE CONFIRMED AND ISOLATED TO THE NORMALLY/OPEN SWITCH, HAYDON NO. 8146, WHICH WOULD NOT FUNCTION PROPERLY AT MINUS 50 DEGREES F. AT THAT TEMPERATURE THE SPRING WOULD NOT RESET, INDICATING THE SPRING CONSTANT CORRECTIVE ACTION-VENDOR IMPROVED INSPECTION TECHNIQUES TO ASCERTAIN QUALITY OF SWITCHES. | | | | | | | |
| CORRECTIVE ACTION-VENDOR IMPROVED INSPECTION TECHNIQUES TO ASCERTAIN QUALITY OF SWITCHES. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-88-06-134 VALVE, FILL AND DRAIN | FAR 27-02108-23 | 820310 | SYC. | YES NO | STRATON | 899228 |
| FAILURE MODE-LEAK-UNIT REJECTED FOR INTERNAL LEAKAGE PAST THE BUTTERFLY. LEAKAGE CONFIRMED AND CAUSED BY TWO SMALL SCRATCHES ON THE VALVE SEAT. LEAKAGE RATE WAS 90CC PER MINUTE VERSUS 2CC PER MINUTE MAXIMUM ALLOWABLE. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-88-06-137 VALVE, FILL AND DRAIN, AIRBORNE | FAR 27-02108-23 | 820309 | SYC. | YES NO | STRATON | 899229 |
| FAILURE MODE-STRUCTURAL-UNIT REJECTED FOR CRACKS ADJACENT TO A WELD. FAILURE CONFIRMED BY VISUAL EXAMINATION. CAUSE ATTRIBUTED TO INADEQUATE WELDING AND INSPECTION TECHNIQUES. XRAY REQUIREMENTS WERE ESTABLISHED IN DECEMBER 1960, HOWEVER, THIS VALVE WAS ACCEPTED IN AUGUST 1960, THEREFORE RECEIVED NO XRAY INSPECTION. | | | | | | | |
| CORRECTIVE ACTION-A SURVEY OF THE VENDORS WELDING, TESTING AND INSPECTION PROCEDURES WERE FOUND TO BE SATISFACTORY. SINCE XRAY PROCESSES HAD BEEN ESTABLISHED AFTER ACCEPTANCE OF THIS VALVE NO FURTHER ACTION TAKEN. ALL VALVES UNDER 50/C CONTROL, AND NOT INSTALLED, WERE SURVEYED AND INSPECTED VISUALLY AND BY X-RAY. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-88-06-144 CHECKVALVE SEAL-V/E | FAR 27-02408-1 | 820426 | SYC. | YES NO | PARKER | 899489 |
| FAILURE MODE-LEAK EXTERNAL. UNIT REJECTED FOR EXTERNAL LEAKAGE FROM THE VALVE BODY-HEX NUT INTERFACE. LEAKAGE CONFIRMED AND ATTRIBUTED TO PRESENCE OF THREAD LUBE AND BALLING IN THE LEAKAGE AREA. 8 IDENTICAL CASES REPORTED ON FAR 80-08-149, -081. | | | | | | | |
| CORRECTIVE ACTION-VENDOR REDESIGNED THE VALVE TO INCLUDE A TEFLON GASKET IN THE QUESTIONED JOINT. | | | | | | | |

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|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | A-90-06-134 TOPPING NOSE BELLOWS | FAR 27-23360-1 | 13F 820421 | WTR | YES NO | YES COSMIC CORP. | 899237 |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR EXTERNAL LEAKAGE FOLLOWING A DPL. LEAKAGE CONFIRMED AND ATTRIBUTED TO A ONE AND ONE HALF INCH LONG CRACK AT THE BOTTOM OF A CONVOLUTION, CAUSE BY FATIGUE DEVELOPED AT A TOOL MARK IN THE MATERIAL. | | | | | | | |
| CORRECTIVE ACTION-VENDOR TO POLISH THEIR FORMING DIES TO PRECLUDE MARKING THE BELLOWS. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | AD82-0049/02-8MO-03-13 B1 TOPPING-LINE CHECK VALVE GASKET | COMPOSITE-PRO/DPL | 13F 820421 | 6/WTR | YES NO | | 899661 |
| FAILURE MODE-LEAK EXTERNAL IN THE B1 TOPPING LINE CHECK VALVE GASKET. | | | | | | | |
| SYSTEM EFFECT-NONE-(LOW TEMPERATURE ENVIRONMENT NEAR THE B1 HYPERCOL CARTRIDGE). | | | | | | | |
| VEHICLE EFFECT-NONE-LOW TEMPERATURE ENVIRONMENT NEAR THE B1 HYPERCOL CARTRIDGE. | | | | | | | |
| CORRECTIVE ACTION-GASKET WAS REPLACED. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A90-06-141 FILL AND DRAIN VALVE SHAFT | FAR 27-02102-23 | 12F 820416 | WTR | YES NO | YES STRATOS | 899231 |
| FAILURE MODE-FAIL TO CEASE TO OPERATE. UNIT REJECTED FOR FAILURE TO CLOSE DURING A VALIDATION PROCEDURE. SAME PROBLEM OCCURRED WITH THIS VALVE ON VEHICLE 9F AT SAFB EARLIER DURING VALIDATION. FAILURE CONFIRMED-AT CRYOGENIC TEMPERATURES THE BUTTERFLY SEIZED AS RESULT OF CORROSION IN THE SHAFT DURING BORES CAUSED BY ELECTROLYTIC ACTION BETWEEN D1 SIMILAR METALS. A TOTAL OF 9 VALVES HAVE HAD THIS PROBLEM TO DATE. | | | | | | | |
| CORRECTIVE ACTION-DESIGN CHANGE RECOMMENDED TO ELIMINATE THE B1-METALLIC CORROSION PROBLEM. VALVES IN THE FIELD WERE CHECKED FOR THIS CONDITION. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-JA-06-122 VALVE CHECK-LOX TOPPING | FAR 27-02501-3 | 820417 | FACTORY | YES NO | YES LANAGAN | 899677 |
| FAILURE MODE-OUT OF TOLERANCE. SEVEN UNITS CHECKED AT THE 60/C SUPPORT DEPOT WERE REJECTED FOR LOW CRACKING PRESSURE. NO FAILURE ANALYSIS CONDUCTED, SINCE VALVES ARE OBSOLETE AND REPLACED BY THE -803 VALVE. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |

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| PROPULSION INTERFACE-A/B LOX FEED | A-9H-08-124 HOSE, V/E SUPPLY FLEX, BELLONAS | FAR 27-02404-803 | 820321 | 8APB | YES NO | FLEX METAL NOS E | 898488 |
| FAILURE MODE-LEAK EXTERNAL. UNIT REJECTED FOR EXTERNAL LEAKAGE. BELLONAS WERE FOUND SPLIT AS RESULT OF FLEXING BEYOND THE ENDURANCE LIMIT OF THE MATERIAL. 5 IDENTICAL CASES REPORTED ON FAR 9H-08-130, -132, -133, -139, -140. | | | | | | | |
| CORRECTIVE ACTION-EC1130 REPLACES THE HOSE WITH 27-02423-3. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | DAG81/D1-6MO-01-12 LOX AIRBORNE FILL AND DRAIN VALVE | COMPOSITE-FRD/DPL 820318 | 12F 820318 | D/MTR | YES NO | STRATON 59-480 | 898331 |
| FAILURE MODE-FAIL TO CEASE TO OPERATE. LOX FILL AND DRAIN VALVE FAILED TO CLOSE AT LOX FINE LOAD COMPLETE OR LOX DRAM COMPLETE (LINE LOADED DURING THIS TEST). | | | | | | | |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY LOX LOAD NOT COMPLETED. | | | | | | | |
| VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED. | | | | | | | |
| CORRECTIVE ACTION-LOX AIRBORNE FILL AND DRAIN VALVE REPLACED. (FAR 90-04-141) | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-9D-08-118 DISCONNECT | FAR 27-21508-11 | 84E 820308 | MTR | YES NO | CONVAIR | 898488 |
| FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE-UNIT REJECTED FOR UNDERSIZE AIRBORNE PROBE O.D. CONDITION WAS CONFIRMED. THE PROBE WAS ALSO PITTED. | | | | | | | |
| CORRECTIVE ACTION-CHANGE E OF DRAWING 27-21508 CORRECTED THE DIMENSIONAL TOLERANCES. ACTION TO CORRECT CORROSION PITTING NOT APPROVED. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-9F-08-106C STAGING VALVE SEAL | FAR 7-02230-11 | 84D 820307 | MTPB | YES NO | THORND | 898230 |
| FAILURE MODE-LEAK-UNIT REJECTED FOR INTERNAL LEAKAGE AT THE POPPET SEAL. NO FAILURE ANALYSIS PERFORMED BECAUSE PART WAS NEVER RECEIVED IN SAN DIEGO. | | | | | | | |
| CORRECTIVE ACTION-NONE. NO FAILURE ANALYSIS PERFORMED. | | | | | | | |

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| PROPULSION INTERFACE-A/B LOX FEED | A-98-08-108 DISCONNECT, LOX TOPPING RINE OFF-A 27-21508-11 IRBORNE | FAR | 820217 | SYC. | YES NO | YES CONVAIR | 899338 |
| FAILURE MODE-CANTAMINATION-UNIT REMOVED DURING ROUTING INSPECTION FOR BEING CORRODED AND PITTED. PROBLEM CONCLUDED TO BE RESULT OF A POROUS HARD COAT AND THE CHARACTERISTICS OF 8084 DURAL TO BE PRONE TO INTERGRANULAR ATTACK WHEN NOT PROTECTED. | | | | | | | |
| CORRECTIVE ACTION-CHANGE PROBE MATERIAL TO 8081 DURAL AND IMPROVE CONTROL OF THE HARD COATING PROCESS. ALL CURRENT TYPE PROBES TO BE INSPECTED FOR ABOVE CONDITIONS. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A98-08-113 V/E LOX SUPPLY CHECK VALVE B NUT | FAR 27-02405-3 | 820215 | ETR | YES NO | YES PARKER | 899490 |
| FAILURE MODE-EXTERNAL LEAK- UNIT REJECTED FOR LEAK FROM A CRACKED HEX NUT. FAILURE ATTRIBUTED TO OVER- TIGHTENING OF ASSEMBLY BY VENDOR. | | | | | | | |
| CORRECTIVE ACTION-VENDOR REINSTRUCTED THEIR PERSONNEL ON TORQUE REQUIREMENTS DURING ASSEMBLY. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-98-08-112 ASSEMBLY BELLOW | FAR 27-23360-1 | 820212 | ETR | YES NO | YES CONVAIR | 899401 |
| FAILURE MODE-EXTERNAL LEAK- UNIT REJECTED FOR LEAK OF GAS DURING CHECKOUT. ANALYSIS REVEALED A CRACK IN THE BELLOW SECTION. IT WAS CONCLUDED CRACK WAS A FATIGUE FAILURE CAUSED BY HOSE BEING BENT IN A TOO SMALL RADIUS AS RESULT OF MISHANDLING. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-98-08-099 LINE ASSEMBLY, TWO INCH INLET | FAR 27-21507-1 | 322 820105 | ETR | YES NO | YES CONVAIR | 899362 |
| FAILURE MODE-STRUCTURAL-LINE REMOVED AFTER A LOX TANKING OPERATION FOR BEING PARTIALLY COLLAPSED AT TWO OF FOUR BEN DS. THE CONDITION WAS ATTRIBUTED TO HANDLING DAMAGE DURING TRANSPORTATION OR ERECTION. | | | | | | | |
| CORRECTIVE ACTION-FIELD PERSONNEL INFORMED OF CONCLUSIONS AND ADVISED TO USE CARE IN HANDLING. | | | | | | | |

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| PROPULSION INTERFACE-A/B LOX FEED | 98-06-064 VALVE, FILL AND DRAIN LOX AIRBORNE | 27-02102-829 | 612702 | ETR | YES | AIRSEARCH | 000111 |
| FAILURE MODE-LEAK-EXTERNAL LEAKING AT THE VALVE SHAFT BEARING COVER. THE SEAL AREA UNDER THE COVER, WAS COATED WITH SOLIDIFIED OXYLUDE, WHICH HAD AGED AND CRACKED. | | | | | | | |
| CORRECTIVE ACTION-VENDOR ALERTED HIS INSPECTION PERSONNEL TO THE PROBLEM OF APPLYING AN EXCESS AMOUNT OF LUBRICANT. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 98-06-064 VALVE, FILL AND DRAIN LOX AIRBORNE | 27-02102-829 | 612702 | ETR | NO | AIRSEARCH | 000046 |
| FAILURE MODE-LEAK-EXTERNAL-LEAKAGE AT THE VALVE SHAFT BEARING COVER. THE SEAL AREA UNDER THE COVER WAS COATED WITH SOLIDIFIED OXYLUDE WHICH HAD AGED AND CRACKED. | | | | | | | |
| CORRECTIVE ACTION-VENDOR ALERTED HIS INSPECTION PERSONNEL TO THE PROBLEM OF APPLYING AN EXCESS AMOUNT OF LUBRICANT. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-9D-06-107 V/E HOSE BELLOWS | FAR 27-02404-803 | 3F 611228 | WTR | YES | FLEXIBLE METAL NO HOSE | 000191 |
| FAILURE MODE-LEAK. TWO UNITS REJECTED FOR EXTERNAL LEAKAGE, ALL CONFIRMED, AND CAUSED BY FLEXING BEYOND THE ENDURANCE LIMIT OF THE BELLOWS MATERIAL. | | | | | | | |
| CORRECTIVE ACTION-ECP 1330 AUTHORIZED REDESIGN RELEASED 3/3/62 AS P/N 27-02423-3. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-9H-06-104 HOSE FLEX, SUSTAINER LOX | FAR 27-02404-803 | 611228 | SAFB | YES | FLEXIBLE METAL NO HOSE | 000339 |
| FAILURE MODE-LEAK-EXTERNAL-UNIT REMOVED FOR EXTERNAL LEAKAGE. LEAKAGE CAME FROM A FATIGUE FRACTURE IN ONE OF THE FL EX SECTION CONVOLUTIONS. FRACTURE IS RESULT OF FLEXING THE BELLOWS BEYOND THE MATERIAL ENDURANCE LIMIT. | | | | | | | |
| CORRECTIVE ACTION-ECP 1330 COVERS REDESIGN OF HOSE. RELEASED 1-12-62, P/N 27-02423-3, TO REPLACE SUBJECT HOSE. UNIT L NEW HOSE IS AVAILABLE. NEW -803 HOSES ARE TO BE INSTALLED PRIOR TO FLIGHT. | | | | | | | |

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| PROPULSION INTERFACE-A/B LOX FEED | AD61-0349/D4850/L2-A40-01-114 VALVE-FILL AND DRAIN | COMPOSITE-FRD/DPL | 1140 61-216 | 1-2/PALC NO | NO | |
| FAILURE MODE-PREATURE OPERATION. PREATURE CLOSING OF LOX AIRBORNE FILL AND DRAIN VALVE DUE TO PREATURE PICK UP OF P 99.5 PERCENT EDO SIGNAL AND FAILURE TO DEPRESS LOX LOAD BUTTON WHEN LOX START WAS DECREASED. | | | | | | |
| SYSTEM EFFECT-OPERATION STOPS PREATURELY. LOX LOADING STOPPED PREATURELY. | | | | | | |
| VEHICLE EFFECT-COUNTDOWN DELAYED. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-98-08-097 DUCT ASSEMBLY, LOX PRESSURE | FAR 27-23318-500 | 30E 611116 | ETR | YES NO | CONVAIR |
| FAILURE MODE-OUT OF TOLERANCE. ASSEMBLY REMOVED BY SITE PERSONNEL FOR A METALLIC RATTILING SOUND WHEN STRUCK WITH THE HAND. RATTLE WAS DETERMINED TO BE CAUSED BY A MAXIMUM TOLERANCE BUILD-UP IN THE TORUS PIN ASSEMBLY IN THE OMEGA JOINT NEAREST THE PUMP INLET. ASSEMBLY DECLARED USABLE BY THE DESIGN GROUP. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | A-49-08-092 VALVE MOTOR, LOX FILL AND DRAIN AT 27-02102-23 REBORNE | FAR 27-02102-23 | 67E 611116 | FACTORY | YES NO | STRATOS |
| FAILURE MODE-SHORT (ELECT.)-DURING PU SYSTEM TESTS PINS E AND C, OPEN AND CLOSE RESPECTIVELY, WERE FOUND TO BE SHORTED TO THE GROUND. THE SHORT WAS TRACED TO THE MOTOR. THE WIRE FROM THE THERMAL OVERLOAD PROTECTOR TO THE BRUSH HOLDER WAS BROKEN AT THE HOLDER SOLDER JOINT AND SHORTED ON THE MOTOR HOUSING. | | | | | | |
| CORRECTIVE ACTION-VENDOR ADVISED THE ACTUATORS WILL BE PRETESTED PRIOR TO ASSEMBLY TO PRECLUDE SUCH CASES IN THE FUTURE. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 9D-08-093 VALVE, CHECK LOX TOPPING | FAR 27-02301-8 | 24E 611116 | WTR | YES NO | M. H. LAMARSON C O. |
| FAILURE MODE-LEAK-UNIT REMOVED FOR INTERNAL LEAKAGE. LEAKAGE COULD NOT BE CONFIRMED DURING FAILURE ANALYSIS. THIS VALVE HAD NOT BEEN QUALIFIED. | | | | | | |
| CORRECTIVE ACTION-THIS VALVE TO BE REPLACED WITH A -801 SUPPLIED BY W.D. LEONARD CO. | | | | | | |

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| PROPULSION INTERFACE-A/B LOX FEED | 46-98-06-091 VALVE, LOX FILL AND DRAIN, AIRBORN E | FAR 27-02102-829 | 880 611103 | ETR | YES NO | YES NO | 899499 |
| FAILURE MODE-LEAK-EXTERNAL-UNIT REMOVED FOR EXTERNAL LEAKAGE FROM THE BUTTERFLY ACTUATOR SHAFT SEAL. LEAKAGE DUE TO ROUGH SURFACE FINISH ON THE SHAFT SEAL AREA. FINISH MEASURED 64 TO 125 RMS, 32 RMS IS REQUIRED. | | | | | | | |
| CORRECTIVE ACTION-VENDOR NOTIFIED AND HE REPLIED ALL SUCH SHAFTS WILL BE INSPECTED FOR PROPER FINISH. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 46-98-06-083 VALVE, LOX FILL AND DRAIN-AIRBORNE | FAR 27-02102-829 | 880 611103 | ETR | YES NO | YES NO | 899276 |
| FAILURE MODE-LEAK-EXTERNAL-UNIT REPLACED DURING VALVE CHECKOUT FOR EXCESSIVE EXTERNAL LEAKAGE FROM THE BUTTERFLY SH APT SEAL AREA. FAILURE ANALYSIS REVEALED EXTERNAL LEAKAGE WITH THE BUTTERFLY CLOSED WHEN PRESSURIZED FROM THE GROUND DIRECTION. NO LEAKAGE WAS EVIDENT WHEN PRESSURIZED FROM THE AIRBORNE DIRECTION. THE ONLY TIME SUCH LEAKAGE WOULD OC CUR IS DURING A LEAK CHECK AS ABOVE PER PROCEDURE 27-93432-8K1E. | | | | | | | |
| CORRECTIVE ACTION-PROCEDURE REVISED TO ELIMINATE THE ABOVE PROBLEM BY E.D. H 2-20-62. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 9K-06-090 LINE ASSEMBLY, LOX TOPPING FLEXIBL E | FAR 27-23561-1 | 41E 611025 | FAPB | YES NO | YES NO | 899498 |
| FAILURE MODE-LEAK-EXTERNAL-HOSE WAS REMOVED FOR EXTERNAL LEAKAGE FROM THE FLEX SECTION. ONE CONVOLUTION CONTAINED A 3/4 INCH CRACK. METAL FATIGUE WAS CAUSE OF FAILURE. IT WAS DETERMINED THE ABOVE RESULTED FROM IMPROPER INSTALLATION , CAUSING UNDEUE STRESS. | | | | | | | |
| CORRECTIVE ACTION-PLANNING WAS REVISED TO REQUIRE MORE POSITIVE INSTALLATION AND INSPECTION METHODS. OTHER VEHICLES IN PRODUCTION WERE CHECKED FOR THIS CONDITION. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 9K-06-085 HOSE FLEXING, V/E LOX SUPPLY | FAR 27-02404-803 | 610927 | FAPB | YES NO | YES NO | 899269 |
| FAILURE MODE-LEAK-EXTERNAL-UNIT REPLACED FOR EXTERNAL LEAKAGE AT THE FLEX SECTION. FAILURE IS DUE TO METAL FATIGUE DUE TO FLEXING THE BELLOWB SECTION BEYOND ENDURANCE LIMIT. | | | | | | | |
| CORRECTIVE ACTION-ECP 1530 AND CIC 98017 INITIATED TO REDESIGN AND REPLACE THIS HOSE WITH 27-02425-1. DURING INTERI N AMR BULLETIN 63 DIRECTB INSTALLATION OF NEW CURRENT HOSES PRIOR TO FLIGHT. | | | | | | | |

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| PROPULSION INTERFACE-A/B LOX FEED | AC-81-0080/81-804-A4-01 TURBOPUMP INLET | CAPTIVE | 1F 610922 | 81/8YC YES NO | | 899349 |
| FAILURE MODE-OUT OF EXPECTED TEST VALUE. BOOSTER AND SUSTAINER LOX PUMP INLET TEMPERATURES EXHIBITED ABNORMALLY HIGH TEMPERATURES DURING ENGINE START. B1 WAS -280.0, B2 WAS -279.1, AND BUST. WAS -279 DEGREES F AT IGNITION. | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 9H-08-082 VALVE, CHECK, LOX TOPPING SYSTEM | FAR 27-02301-3 | 50E 610625 | FAB NO O. | YES M.M. LAMAGAN C NO O. | 899275 |
| FAILURE MODE-LEAK-VALVE REPLACED DURING MISSILE CHECKOUT FOR INTERNAL LEAKAGE IN THE CHECK DIRECTION. THIS VALVE HAS NOT BEEN QUALIFIED. EXAMINATION REVEALED THE TEFLON SEAL HAD COLD FLOWED PREVENTING FULL CONTACT WITH POPPET. | | | | | | |
| CORRECTIVE ACTION-REPLACEMENT WITH A-801 VALVE SUPPLIED BY M.D. LEONARD. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 88-08-054 HOSE, VERNIER ENGINE FLEXIBLE | FAR 27-02404-801-803 | 610804 | YES FLEXIBLE METAL NO HOSE | | 899291 |
| FAILURE MODE-STRUCTURAL-FIFTEEN FLEX HOSES FROM E SERIES VEHICLES, AT STANMORE AMP, EAFB, WTR, FAFB AND S.D. ALL HOSES LEAKED EXTERNALLY FROM ONE OF THE THREE FLEX SECTIONS IN THE HOSE. CAUSE CONCLUDED TO BE RESULT OF FATIGUE AS RESULT OF FLEXING THE HOSNEL BELLOW. | | | | | | |
| CORRECTIVE ACTION-ECP 1258 PREPARED TO REDESIGN THE HOSE. UNTIL NEW HOSES ARE AVAILABLE AMR BULLETIN NO. 89 DIRECTS INSTALLATION OF NEW HOSES PRIOR TO FLIGHT. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 9H-08-075 HOSE, FLEX, V/E LOX SUPPLY | FAR 27-02404-803 | 33E 610602 | FAB NO HOSE | YES FLEXIBLE METAL NO HOSE | 899109 |
| FAILURE MODE-LEAKAGE. EXTERNAL LEAKAGE IN THE FLEXIBLE PART OF THE HOSE. AS IN PREVIOUS CASES THIS FAILURE OF FLEXING BEYOND THE ENDURANCE LIMIT OF THE HOSNEL MATERIAL. THIS INSTANCE OCCURRED UNDER STAND-BY CONDITIONS. | | | | | | |
| CORRECTIVE ACTION-ECP 1258 PREPARED TO REDESIGN HOSE. AMR BULLETIN NO. 89 DIRECTS INSTALLATION OF NEW HOSES PRIOR TO FLIGHT UNTIL NEW HOSES ARE AVAILABLE. | | | | | | |

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| PROPULSION INTERFACE-A/B LOX FEED | 9D-08-073 VALVE, CHECK, LOX TOPPING | FAR 27-02501-5D | 27E 610615 | WTR | YES NO | W.M. LANAGAN C O. | 999109 |
| FAILURE MODE-OUT OF TOLERANCE. VALVE FAILED TO RELIEVE AT LESS THAN 5 PSI WHILE FUELING VEHICLE. TESTS CONFIRMED NO 64 CRACKING PRESSURE AND WAS DUE TO EXCESSIVE SPRING FORCE. VALVE WAS NOT QUALIFIED. | | | | | | | |
| CORRECTIVE ACTION-NONE-VALVE BEING REPLACED BY -801 ON ABOUT 6-12-61. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | CT-9B-08-003 SUSTAINER START FLEX HOSE SLEEVE | FAR 27-02166-3 | 610609 | ETR | YES NO | FLEX. METAL NO SE | 998162 |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR A CRACKED BLEEVE. AN INCOMPLETE ANALYSIS INDICATED SOME INCLUSION IN THE PARENT METAL CAUSING THE LONGITUDINAL CRACK. THE SLEEVE WAS MISPLACED PRIOR TO ANALYSIS COMPLETION. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | AB-61-0008/14-603-03 VERNIER FUEL SUPPLY-DUCTING | FAR | 1-4F 610602 | 1-4/EDWA RDS | YES NO | | 999039 |
| FAILURE MODE-LEAK, EXTERNAL. LOX FROM THE VERNIER LOX BLEED DIFFUSER HAD BEEN SHOWERING ON THE VERNIER FUEL SUPPLY LINE, THEREBY FREEZING THE FUEL AND BLOCKING FUEL FLOW. | | | | | | | |
| CORRECTIVE ACTION-INSTALLATION OF OVER BOARD VERNIER LOX BLEEDS. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 9H-08-070 VALVE, CHECK, LOX TOPPING | FAR 27-02501-5D | 23E 610529 | FAB | YES NO | W.M. LANAGAN C O. | 999107 |
| FAILURE MODE-LEAK-FAILED DUE TO INTERNAL LEAKAGE DURING MISSILE CHECKOUT AT 7 PSI GAS PRESSURE. TEFLON VALVE SEAT C OLD FLOWED AND SHREDDED. THIS VALVE HAD NOT BEEN QUALIFIED. | | | | | | | |
| CORRECTIVE ACTION-QUALIFIED VALVES, -801 BY WALLACE O LEONARD CO. TO BE AVAILABLE 6-12-61. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 9D-08-068 HOSE, FLEXIBLE, V/E LOX SUPPLY | FAR 27-02404-803 | 27E 610503 | WTR | YES NO | FLEXIBLE METAL HOSE | |
| FAILURE MODE-LEAKAGE. HOSE REPORTED FOR EXTERNAL GAS LEAKAGE IN A FLEXIBLE SECTION FOLLOWING ENGINE GIMBALLING CHECK ROUT. EXAMINATION REVEALED FATIGUE FRACTURES IN THE CONVOLUTIONS. NO MATERIAL DEFECTS NOTED. CAUSE CONSIDERED RESULT | | | | | | | |

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GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DA'A SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO | |
|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| OF FLEXING BELLOWS BEYOND ENDURANCE LIMIT OF MATERIAL. | | | | | | | 099106 |
| CORRECTIVE ACTION-ECF 1236 PREPARED FOR REDESIGN. AMR BULLETIN NO. 69 DIRECTS INSTALLATION OF NEW HOSES PRIOR TO FLIGHT UNTIL REDESIGNED HOSES ARE AVAILABLE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 98-08-062 DISCONNECT, START TANK VENT LINE | FAR 27-20424-1 | 91D 610323 | ETR | YES NO | CONVAIR | 099222 |
| FAILURE MODE-EXTERNAL LEAK-LEAK AT SLIP JOINT AT THE FIRE SHIELD. FAILURE NOT CONFIRMED DUE TO LACK OF COMPLETE SLIP JOINT FOR ANALYSIS. THE PART RECEIVED WAS IN TOLERANCE. THIS JOINT IS NOT INTENDED TO BE LEAKPROOF. FAILURE CONSIDERED IMPROBABLE AND COULD NOT BE CONFIRMED. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | AD61-0078/DA391/01-SMO-02-07 | COMPOSITE-FRD/DPL | 7E 410310 | | YES NO | | 099639 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. LOS IN TRANSFER LINE INDICATION DID NOT OCCUR AT THE PRESCRIBED TIME AND LOS LOAD DID NOT START. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-COMPOSITE DELAYED. | | | | | | | |
| CORRECTIVE ACTION-LOS IN TRANSFER LINE PROBE WAS SIMULATED BY MEANS OF A SWITCH ON THE OVERSIDE PANEL LOCATED NEXT TO THE LAUNCH CONTROL CONSOLE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 9A-08-038 VALVE, LOX TOPPING CHECK | FAR 27-02301-3 | 601130 | EATB | YES NO | M.H. LAMAGANCO. | 099692 |
| FAILURE MODE-STRUCTURAL- THIS REPORT COVERS SIX VALVES. TWO OF THE VALVES HAVING KEL-F POPPETS WHICH SHATTERED. THE REMAINING FOUR VALVES CONTAINED ALUMINUM POPPETS IN WHICH THE POPPET GUIDE STEMS WERE GALLED | | | | | | | |
| CORRECTIVE ACTION-A -S VALVE WAS DEVELOPED CONTAINING HARD ANODIZED ALUMINUM POPPETS AND A SOFTER POPPET SPRING TO REDUCE POPPET CHATTER. EFFECTIVITY WAS ON E SERIES BY 1-1-61 | | | | | | | |

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

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|---|--|--------------------------------|----------------------------|---------------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | SA-06-058 LOX TOPPING CHECK VALVE POPPET | FAR 27-02501-3 | 601130 | EAFB | YES | M.H. LAMAGAN CO | 899676 |
| FAILURE MODE-STRUCTURAL- THIS REPORT COVERS SIX VALVES. TWO OF THE VALVES HAVING KEL-F POPPETS WHICH SHATTERED. THE REMAINING FOUR VALVES CONTAINED ALUMINUM POPPETS IN WHICH THE POPPET GUIDE STEMS WERE GALLED. | | | | | | | |
| CORRECTIVE ACTION-A -5 VALVE WAS DEVELOPED CONTAINING HARD ANODIZED ALUMINUM POPPETS AND A SOFTER POPPET SPRING TO REDUCE POPPET CHATTER. EFFECTIVITY WAS ON E SERIES BY 1-1-61. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | AE80-0541/P1-408-01-71 | FLIGHT | 71D 601013 | 11/4TR 113.4 | YES NO | | 897666 |
| FAILURE MODE-CONTAMINATION. ERRATIC SUSTAINER LOX PUMP INLET PRESSURE DATA AND B1 PERFORMANCE DATA DECREASES INDICATE AN OBSTRUCTION WAS IN THE LOX LOW PRESSURE DUCT. | | | | | | | |
| SYSTEM EFFECT-OPERATION TOO LOW. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | ETR-013/14-507-1M-SE B2 GAS GENERATOR INJECTOR LOX POPPET | CAPTIVE | 1-4 E SE RIES 600306 | 1-4/EDMA RDS T+0.16 | YES NO | | 899593 |
| FAILURE MODE-OUT OF EXPECTED VALUE. LOX POPPET UPSTREAM PRESSURE INDICATED A PREMATURE PRESSURE RISE AT T+0.16 SEC. THIS IS INDICATIVE OF HOT GAS LEAKAGE PAST THE POPPET. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-NONE | | | | | | | |
| CORRECTIVE ACTION-INJECTOR AND POPPET WERE EXAMINED AND FOUND TO BE IN SATISFACTORY CONDITION. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | ETR-013/14-507-1M-SE B2 PUMP INLET OMEGA JOINT | CAPTIVE | 600306 | 1-4/EDMA RDS | YES NO | | 899666 |
| FAILURE MODE-STRUCTURAL OMEGA JOINT WAS SPREAD EXCESSIVELY DUE TO A HIGH PRESSURE SURGE IN THE SYSTEM AT ENGINE START. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | | |

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GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

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|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | 98-08-031 START TANK FLEXIBLE HOSE | FAR 27-02245-1 | S1D 600411 | ETR | YES NO | FLEXIBLE METAL HOSE CO. | 999397 |
| FAILURE MODE-EXTERNAL LEAK - HOSE REPORTED LEAKING WHILE INSTALLED. FAILURE ANALYSIS DETERMINED LEAKAGE IN THE CONVOLUTED SECTION. DURING REMOVAL OF WIRE BRAID TO UNCOVER THE CONVOLUTES, THE CONVOLUTES WERE INADVERTENTLY CUT, MASKING THE FAILURE. AS A RESULT NO CONCLUSIONS WERE REACHED. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 98-08-031 HOSE, LOX START TANK FLEXIBLE | FAR 27-02245-1 | S1D 600411 | ETR | YES NO | FLEXIBLE METAL HOSE CO | 999394 |
| FAILURE MODE-LEAK-EXTERNAL - THE HOSE WAS REPORTED AS LEAKING WHILE INSTALLED. DURING FAILURE ANALYSIS THE LEAKAGE WAS DUPLICATED AND WAS DETERMINED TO BE IN THE CONVOLUTION SECTION. WHILE REROUTING THE WIRE BRAID, TO UNCOVER THE CONVOLUTES, THE CONVOLUTES WERE INADVERTENTLY CUT, MASKING THE REPORTED FAILURE. AS RESULT NO CONCLUSIONS WERE REACHED. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | ETR-009/14-503-E1-SE B2 LOX PUMP INLET DUCT OMEGA JOINT | CAPTIVE 27-235,8-103 | 14E 600403 | 1-4/EDMA RDS | YES NO | | 999014 |
| FAILURE MODE-FAIL DURING OPERATION. OMEGA JOINT INDICATED EXCESSIVE SPREADING, APPARENTLY DUE TO HIGH PRESSURE SURGES AT ENGINE START. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-DUCTING WAS REPLACED AND THE LOX SLUG INJECTION WAS MODIFIED TO PREVENT THE PRESSURE SURGE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 98-08-048 STAGING VALVE SEAL, LOX START TANK | FAR 27-20424-1 | 44D 600219 | ETR | YES NO | CONVAIR | 999392 |
| FAILURE MODE-EXTERNAL LEAK - UNIT WAS LEAKING WHILE INSTALLED. PART OF THE TEFLON LIP SEAL WAS FOUND BROKEN. SEAL ALSO CONTAINED A HEAVY LAYER OF LUBRICANT, CONTRARY TO T.O. INSTRUCTIONS. SEAL DAMAGE WAS CAUSED DURING A DEMATING OPERATION BY THE MALE PROBE CATCHING AND SHEARING THE SEAL. | | | | | | | |
| CORRECTIVE ACTION-EFFECTIVE APPROX. 15 APRIL 1960, A DECAL WAS PLACED ON EACH UNIT INSTRUCTING THAT NO LUBRICANT BE USED AND THAT THE SEAL BE REPLACED PRIOR TO REMATE. | | | | | | | |

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15 JUN 1966

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO | |
|--|--|--------------------------------|--------------------------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | 98-08-048 DISCONNECT SEAL, STAGING, START TA 27-20424-1 NK DRAIN | FAR | 463 600219 | ETR | YES NO | YES CONVAIR | 000000 |
| FAILURE MODE-LEAK - EXTERNAL - THE UNIT WAS LEAKING EXTERNALLY WHILE INSTALLED. A PART OF THE TEFLON LIP SEAL WAS FOUND BROKEN AWAY. THE SEAL ALSO CONTAINED A HEAVY LAYER OF LUBRICANT, CONTRARY TO T.O. INSTRUCTIONS. SEAL DAMAGE WAS CAUSED DURING A DEMATING OPERATION BY THE MALE PROBE CATCHING AND SHEARING THE SEAL. | | | | | | | |
| CORRECTIVE ACTION-EFFECTIVE APPROXIMATELY APRIL 15, 1966 A DECAL WAS PLACED ON EACH UNIT INSTRUCTING THAT NO LUBRICANT BE USED AND THAT THE SEAL BE REPLACED PRIOR TO REMATE. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 98-08-045 A/B LOX F AND D VALVE GEARS | FAR | 150-44D 27-02102-823, -825 60010. | SYC. | YES NO | YES AIRSEARCH | 000001 |
| FAILURE MODE-CONTAMINATION. BOTH VALVES S/N 128P-112, VEHICLE 130, AMR, AND 69P-136, VEHICLE 240, EAFB, FAILED TO OPEN WITH POWER. BOTH ACTUATOR GEAR TRAINS WERE SEIZED BY RUST AND CORROSION AS RESULT OF WATER ENTRANCE. | | | | | | | |
| CORRECTIVE ACTION-THE -829 VALVE WAS PHASED INTO USE, WHICH CONTAINS THE SEALED ACTUATOR AND CONTAINS A DESICCANT. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 98-08-045 A/B FILL AND DRAIN VALVE ACTUATOR | FAR | 150 27-02102-823 600107 | ETR | YES NO | YES AIRSEARCH | 000000 |
| FAILURE MODE-FAIL TO OPERATE. VALVE FAILED TO OPEN WITH POWER. ACTUATOR GEAR TRAIN WAS SEIZED WITH RUST AND CORROSION AS RESULT OF WATER ENTRANCE. | | | | | | | |
| CORRECTIVE ACTION-829 VALVE WAS PHASED INTO USE, CONTAINING A SEALED ACTUATOR WITH DESICCANT. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 98-08-045 A/B FILL AND DRAIN VALVE ACTUATOR | FAR | 240 27-02102-823 600107 | SYC | YES NO | YES AIRSEARCH | 000001 |
| FAILURE MODE-FAIL TO OPERATE. VALVE FAILED TO OPEN WITH POWER. ACTUATOR GEAR TRAIN WAS SEIZED WITH RUST AND CORROSION AS RESULT OF WATER ENTRANCE. | | | | | | | |
| CORRECTIVE ACTION-829 VALVE WAS PHASED INTO USE, CONTAINING A SEALED ACTUATOR WITH DESICCANT. | | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1968

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO | |
|--|--|---------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | 9A-08-044 PRE-LOX VALVE, LOX | FAR 27-02251-3 | 24D 591219 | EDWARDS | YES NO | B.M.HADLEY | 000007 |
| FAILURE MODE-FAIL TO OPERATE. VALVE COULD NOT BE OPENED WITH 800 POUNDS TORQUE. | | | | | | | |
| CORRECTIVE ACTION-THIS VALVE WAS MODIFIED FROM AN EARLY B AND C SERIES VALVE WHICH REQUIRED 3600 INCH POUNDS TORQUE. VALVE WAS INSTALLED INADVERTENTLY AT SYCAMORE PRIOR TO SHIPMENT. NO CORRECTIVE ACTION WAS TAKEN. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 9A-08-044 PREVALVE | FAR 27-02251-3 | 24D 591219 | EDWARDS | YES NO | B.M.HADLEY | 000008 |
| FAILURE MODE-OUT OF TOLERANCE - VALVE COULD NOT BE OPENED WITH 800 POUNDS TORQUE. | | | | | | | |
| CORRECTIVE ACTION-THIS VALVE WAS MODIFIED FROM AN EARLY B AND C SERIES VALVE WHICH REQUIRED 3200 INCH POUNDS TORQUE. VALVE WAS INSTALLED INADVERTENTLY AT SYCAMORE PRIOR TO SHIPMENT. NO CORRECTIVE ACTION TAKEN. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | FTAB450/P3-4B4-01-40 LOX START/TANK VENT LINE, STAGING DISCONNECT | COMPOSITE-FRD/DPL 400 591214 | 13/ETR | YES NO | | | 001030 |
| FAILURE MODE-LEAK-EXTERNAL. LOX LEAK FOUND AT THE LOX START TANK VENT LINE DURING DISCONNECT. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-LOX START TANK VENT LINE STAGING DISCONNECT REPLACED. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 9D-08-059 A/L FILL AND DRAIN VALVE SWITCH, 2 Z-02102-025 PRING | FAR 27-02102-025 | 9D 591024 | WTR | YES NO | AIRSEARCH | 000372 |
| FAILURE MODE-FAIL DURING OPERATION-VALVE ACTUATED IN SHORT JERRY MOTIONS. TESTS INDICATED ACTUATION WAS NORMAL, BUT INDICATION WAS SPASMODIC. THIS WAS CAUSED BY THE ANTI-LEAK SPRING, BETWEEN THE OPEN LATCH AND CAM, EXERTING A FORCE ON THE INTERNAL SWITCH RETURN SPRING, PREVENTING THE SWITCH FROM RETURNING TO ITS NORMAL POSITION. | | | | | | | |
| CORRECTIVE ACTION-VENDOR REDESIGNED THE SWITCH SPRING ARRANGEMENT TO PREVENT ABOVE PROBLEM. CHANGE IS ON -027 AND -029 VALVES. | | | | | | | |

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GENERAL DYNAMICS
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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

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|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | 9D-06-039 A/BLOXFANDVALVE, SWITCH | FAR 27-02102-025 | 210 591025 | WTR | YES NO | YES AIRSEARCH | 899700 |
| FAILURE MODE-FAIL TO OPERATE. NO CLOSED INDICATION ALTHOUGH VALVE OPERATION WAS NORMAL. THE CLOSED SWITCH ACTUATING CAM SCREW WAS IMPROPERLY ADJUSTED. READJUSTMENT CURED THE PROBLEM. | | | | | | | |
| CORRECTIVE ACTION-VENDOR IMPROVED HIS Q.C. PROCEDURES TO PREVENT IMPROPER ADJUSTMENT. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 9D-06-039 A/B FILL AND DRAIN VALVE SWITCH | FAR 27-02102-025 | 210 591025 | WTR | YES NO | YES AIRSEARCH | 899494 |
| FAILURE MODE-FAIL DURING OPERATION.-NO CLOSED INDICATION ALTHOUGH VALVE OPERATION WAS NORMAL. THE CLOSED SWITCH ACTUATING CAM SCREW WAS IMPROPERLY ADJUSTED. READJUSTMENT CURED THE PROBLEM. | | | | | | | |
| CORRECTIVE ACTION-VENDOR IMPROVED HIS Q.C. PROCEDURES TO PREVENT IMPROPER ADJUSTMENT. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | EM1332/P4-402-00-10 AIRBORNE FILL AND DRAIN VALVE | FRF | 100 590903 | 14/ETR -120 | YES NO | | 893387 |
| FAILURE MODE-FAIL TO CEASE TO OPERATE. THE AIRBORNE LOX FILL AND DRAIN VALVE FAILED TO CLOSE DURING COUNTDOWN POSSIBLY DUE TO TEMPORARY MALFUNCTION OF THE VALVE OR ASSOCIATED CIRCUITRY. THE COUNTDOWN WAS RECYCLED AND THE VALVE CLOSED SATISFACTORILY ON REPEATED TRIALS AND IT WAS DECIDED TO RESUME THE COUNTDOWN. | | | | | | | |
| SYSTEM EFFECT-OPERATION DOES NOT START. AIRBORNE LOX FILL AND DRAIN VALVE REMAINED OPEN, PREVENTING START OF FINAL PHASES OF SECURE FROM TANKING OPERATION. | | | | | | | |
| VEHICLE EFFECT-COUNTDOWN DELAYED. COUNTDOWN WAS DELAYED 9 MINUTES. | | | | | | | |
| CORRECTIVE ACTION-NONE INDICATED. POSSIBLE CAUSE OF FAILURE COULD HAVE BEEN TEMPORARY MALFUNCTION OF VALVE. OTHER POSSIBILITY COULD BE TEMPORARY MALFUNCTION OF LOGIC CIRCUITRY. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | FT68093/P4-402-00-10 VALVE-FILL AND DRAIN-LOX | FRF | 100 590903 | 14/ETR -420 | YES NO | | 893285 |
| FAILURE MODE-FAIL TO CEASE TO OPERATE. THE AIRBORNE LOX FILL AND DRAIN VALVE DID NOT CLOSE UPON COMMAND. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-COUNTDOWN DELAYED. NINE MINUTE HOLD AND 8 MINUTE RECYCLE. | | | | | | | |
| CORRECTIVE ACTION-CYCLED VALVE AND IT CLOSED IMMEDIATELY. REPEATED CYCLING INDICATED NORMAL OPERATION AND TEST WAS RESUMED. | | | | | | | |

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

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|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | FTA 8084/P2-302-00-11 FILL AND DRAIN VALVE | COUNTDOWN | 11C 390821 | 12/ETR -80 | NO NO | | 098248 |
| FAILURE MODE-FAIL TO CEASE TO OPERATE AT PRESCRIBED TIME. PANEL OPERATOR DID NOT RECEIVE LIGHT INDICATION THAT AIRBORNE LOX FILL AND DRAIN VALVE HAD CLOSED. | | | | | | | |
| SYSTEM EFFECT-OPERATION DOES NOT START. NO INDICATION THAT AIRBORNE LOX FILL AND DRAIN VALVE HAD CLOSED UPON COMMAND. | | | | | | | |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 8 MINUTE HOLD AND 3 MINUTE 30 SECOND RECYCLE. | | | | | | | |
| CORRECTIVE ACTION-INVESTIGATION REVEALED A DEFECTIVE INDICATOR LIGHT BULB. BULB WAS REPLACED. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 98-08-36 A/B LOX F AND D VALVE | FAR 27-08102-823 | 14D 390814 | ETR | YES NO | YES AIRRESEARCH | 098702 |
| FAILURE MODE-FAIL TO CEASE TO OPERATE. VALVE WOULD NOT COMPLETELY CLOSE PRIOR TO AN FRF UNTIL FOURTH ATTEMPT. ACTUATOR GEAR TRAIN CONTAINED EVIDENCE OF CORROSION AND RUST, INDICATING WATER HAD BEEN PRESENT. TWO UNITS DIPPED IN WATER AND THEN IN LN2 WOULD NOT OPERATE UNTIL WARNED TO ABOVE FREEZING, INDICATING ICE WAS JAMMING ACTUATOR. | | | | | | | |
| CORRECTIVE ACTION-TEST BASE NOTIFIED OF CAUSE OF FAILURE. VENDOR RE-DESIGNED THE ACTUATOR TO SEAL THE ACTUATOR HOUSING TO PREVENT ENTRANCE OF WATER. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | AZC-27-053/P1-404-00-11 DUCTING-LOX SUPPLY | FLIGHT | 11D 390728 | 11/ETR 280 | YES NO | | 098808 |
| FAILURE MODE-LEAK-EXTERNAL-A LOX LEAK DEVELOPED AT THIS TIME IN ENGINE COMPARTMENT. ENGINE COMPARTMENT TEMPERATURE INSTRUMENTATION REFLECTED COLD ENVIRONMENT. | | | | | | | |
| SYSTEM EFFECT-NONE. HOWEVER LOX LEAKAGE PROXIE VERNIER HYDRAULIC PRESSURE SUPPLY LINE, RESULTING IN LOSS OF HYDRAULIC PRESSURE TO VERNIER ACTUATOR. | | | | | | | |
| VEHICLE EFFECT-LOSS OF VEHICLE STABILITY DUE TO FREEZING OF HYDRAULIC PRESSURE LINE. | | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | FTA 5073/P3-401-00-14 TRANSDUCER-INSTRUMENTATION LANDLIN E | FRF | 14D 390724 | 13/ETR 0 | YES NO | | |
| FAILURE MODE-CONTAMINATION. HYDRAULIC FLUID CONTAMINATION OF THE VI LO2 INLET PRESSURE TRANSDUCER CAUSED TRANSDUCER FAILURE AT ENGINE START. | | | | | | | |
| SYSTEM EFFECT-EXPLOSION. TRANSDUCER EXPLODED AT ENGINE START WITH A RESULTING BURST OF FLAME WHICH WAS SEEN BY A PERISCOPE OBSERVER. | | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

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|---|--|--------------------------------|---------------------|----------------------------|--------------------|-----------------------|
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED. CUTOFF WAS INITIATED BY THE TEST CONDUCTOR. TEST WAS RECYCLED TO MINUS 70 MINUTES AND HELD FOR 88 MINUTES BEFORE TEST TERMINATION. CORRECTIVE ACTION-UNKNOWN. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 86-06-033 A/B LOX FILL AND DRAIN VALVE SEAL | FAR 27-02102 | 590625 | SYCAMORE | YES | AIRESRESEARCH NO |
| FAILURE MODE-INTERNAL LEAK. LEAKAGE FOUND AT 2 PSIG DURING LEAK CHECK. REL-F LIP SEAL WAS DAMAGED. DAMAGE TO SEAL OCCURRED WHEN A/B AND GROUND HALVES ENGAGED WHILE THE A/B FLAPPER WAS OPEN. PROCEDURES CALLS FOR VALVE TO BE CLOSED WHEN MATING HALVES. | | | | | | |
| CORRECTIVE ACTION-SITE PERSONNEL NOTIFIED OF CAUSE OF FAILURE AND CAUTIONED TO FOLLOW PROCEDURES. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 86-06-029 FUEL DUCT, SUSTAINER LOW PRESSURE | FAR 7-22232-3 | 2D 590613 | SYCAMORE | YES | CONVAIR NO |
| FAILURE MODE-STRUCTURAL-DUCT CRACKED IN A FLEXIBLE BELLOWS SECTION CONTAINING 16 CONVOLUTIONS. MATERIAL IN FAILED AREA WAS APPROXIMATELY ONE HALF NORMAL THICKNESS. | | | | | | |
| CORRECTIVE ACTION-NONE-IN VIEW OF SATISFACTORY EXPERIENCE ON B AND C MISSILES AND INCORPORATION OF AN IMPROVED BELL QMS ON D SERIES. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | 51-305-03-02 LOX FILL AND DRAIN VALVE | CAPTIVE | 2C 581223 | BYC | YES | NO |
| FAILURE MODE-CUT OF TOLERANCE. AFTER DUMPING LOX THE LOX FILL AND DRAIN VALVE FAILED TO FULLY CLOSE IN TIME FOR ENGINE START. PROBABLE CAUSES ARE LOX TANK AT SEQUENCE 3 PRESSURE AND VALVE TEMPERATURE LOWER THAN NORMAL DUE TO TOPPING FLOW. | | | | | | |
| SYSTEM EFFECT-NONE. TEST TERMINATED PRIOR TO ENGINE START. | | | | | | |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED. | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | EM-1028/TEST 14-308-84 LOX PRE-VALVE | CAPTIVE | 580806 | 1-4/EDMA RDS 233 SEC | YES | NO |
| FAILURE MODE-PREATURE OPERATION. TEST TERMINATED PREMATURELY AFTER 0.38 SECONDS OF SOLO VERNIER OPERATION WHEN LOX PRE-VALVE AUTOMATICALLY LEFT OPEN POSITION AS A NORMAL RESULT OF SHUTDOWN. THE LOX PRE VALVE INTERLOCK CIRCUITRY HAS | | | | | | |

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| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO | |
|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| D NOT BEEN MODIFIED TO PREVENT DROPOUT OF THE LOX PRE-VALVE MICROSWITCH FROM INITIATING VERNIER CUTOFF. | | | | | | | 003030 |
| SYSTEM EFFECT-OPERATION STOPS EARLY. MODIFICATION TO LOX PRE-VALVE INTERLOCK CIRCUITRY HAD NOT BEEN ACCOMPLISHED TO THIS TEST. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | PTA2710/P4-108-00-15 DUCTING AND TUBING-RIGID | FRP | 15A 280310 | 14/ETR | YES NO | | 003010 |
| FAILURE MODE-STRUCTURAL. A SOURCE WAS DISCOVERED IN THE V2 LOX LINE. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED. THIS PROBLEM TOGETHER WITH ANOTHER PROBLEM CAUSED TEST CANCELLATION. | | | | | | | |
| CORRECTIVE ACTION-LINE WAS REPLACED. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | TS-11.1133P-8 V2 LOX FLOWMETER/FITTING | CAPTIVE | 5A 571029 | 1-1/EDMA RDS | YES NO | | 003031 |
| FAILURE MODE-LEAK-EXTERNAL. DURING THE TEST THE PRESENCE OF VAPORS WAS EVIDENT IN THE VICINITY OF THE V2 PROPELLANT VALVE. POST TEST INVESTIGATION REVEALED THE LOX FLOWMETER FITTING WAS LEAKING. | | | | | | | |
| SYSTEM EFFECT-LOW TEMPERATURE ENVIRONMENT. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | EN-757/1-A-115-3P4 LOX PRE-VALVE CONTROL VALVE | CAPTIVE | 2A 571026 | 1A/EDMA D4 | YES NO | | 000451 |
| FAILURE MODE-FAIL DURING OPERATION. THE LOX PRE-VALVE CONTROL VALVE WAS NOT PROPERLY ACTUATING THE LOX PRE-VALVE. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RE-SCHEDULED. | | | | | | | |
| CORRECTIVE ACTION-THE LOX PRE-VALVE CONTROL VALVE (SOLENOID) MV-500 WAS REPLACED. A DECISION WAS INSTITUTED TO MODIFY THE LOX PRE-VALVE CONTROL VALVE CONFIGURATION BY INSTALLING TWO MV-75 SOLENOIDS IN PLACE OF THE EXISTING MV-500 SOLENOIDS. | | | | | | | |

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|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B LOX FEED | EM6341-1,104,SP-1 BOOSTER LOX START TANK REGULATOR | CAPTIVE | SA 570929 | 1-1/EDWA RDS | YES NO | | 000276 |
| <p>FAILURE MODE-OUT OF TOLERANCE. THE BOOSTER LOX START TANK REGULATOR COULD NOT BE SET TO THE PROPER LEVEL.</p> <p>SYSTEM EFFECT-NONE. THE SYSTEM WAS NOT YET IN OPERATION.</p> <p>VEHICLE EFFECT-COUNTDOWN WAS DELAYED THE REGULATOR HAD TO BE REPLACED.</p> <p>CORRECTIVE ACTION-REGULATOR WAS REPLACED.</p> | | | | | | | |
| PROPULSION INTERFACE-A/B LOX FEED | EM6341-1,104,SP-1 VERNIER START TANK HIGH PRESSURE L INE B-MUT | CAPTIVE | SA 570929 | 1-1/EDWA RDS | YES NO | | 000275 |
| <p>FAILURE MODE-LEAK-EXTERNAL. LOOSE VERNIER LOX START TANK HIGH PRESSURE LINE B-MUT.</p> <p>SYSTEM EFFECT-NONE.</p> <p>VEHICLE EFFECT-COUNTDOWN WAS DELAYED IN ORDER TO TAKE REMEDIAL ACTION.</p> <p>CORRECTIVE ACTION-THE B-MUT WAS TIGHTEN.</p> | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 574-3-66-27 | FLIGHT | 184D 660407 | 368 | YES YES | GO/C | 000419 |
| <p>FAILURE MODE-PREATURE OPERATION. THE PU SYSTEM WAS UNABLE TO CORRECT FOR A LOX RICH ERROR ALTHOUGH ITS OPERATION WAS AS PROPER. SECO OCCURRED 8 SECONDS EARLY AS THE RESULT OF FUEL DEPLETION. FUEL LEAKAGE IS A POSSIBLE CAUSE.</p> <p>SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. PREATURE FUEL DEPLETION.</p> <p>VEHICLE EFFECT-PREATURE SUSTAINER ENGINE CUTOFF ALTHOUGH MISSION REQUIREMENTS WERE MET.</p> <p>CORRECTIVE ACTION-OPEN-INVESTIGATION IS BEING PERFORMED TO DETERMINE IF PRIMARY CAUSE IS LEAKAGE OR FUEL RICH BURNING OF THE BOOSTER ENGINES.</p> | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | SLV-AS-08-3017-P PREVALVE | FAR 7-02297-1 | 651189 | FACTORY | YES NO | MADLEY 10377-1 | |
| <p>FAILURE MODE-INTERNAL LEAK. VALVE REPORTEDLY LEAKED 2200 CUBIC CENTIMETERS PER MINUTE PAST THE BUTTERFLY. THE LEAK WAS MARGINAL AND ATTRIBUTED TO IMPROPER ANGLE OF THE SEAL SPRING SEALING FORCE. VISUAL INSPECTION REVEALED THE SPRING WAS BENT BEYOND REQUIRED TOLERANCE.</p> <p>CORRECTIVE ACTION-GO/C QUALITY CONTROL CORRECTIVE ACTION WAS INITIATED REQUESTING A SURVEY OF ALL MODIFIED FUEL PNE VALVES TO ASSURE CORRECT REMORK, TESTING, AND DOCUMENTATION. CORRECTIVE ACTION IS DOCUMENTED IN FAR SLV-AS-08-3746.</p> | | | | | | | |

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| PROPULSION INTERFACE-A/B FUEL FEED | SLV-99-08-3018-7 SUSTAINER FUEL PRE-VALVE. | FAR 27-02250-3 | 851112 | FACTORY | YES NO | FAIRCHILD-STRATON 703 82-320-1 | 890389 890374 |
| FAILURE MODE-LEAK. UNIT LEAKED 150 STANDARD CUBIC INCHES PER MINUTE DUE TO THE POSSIBILITY OF A LARGE CONTAMINANT CAUGHT BETWEEN THE BUTTERFLY SEAL AND VALVE BODY. VISUAL INSPECTION REVEALED TWO SMALL CUTS AND CONSIDERABLE MOLYBDENUM-DISULFIDE LUBRICANT ON THE OUTSIDE OF THE SEAL. | | | | | | | |
| CORRECTIVE ACTION-FAILURE WAS NOT CONFIRMED. NO CORRECTIVE ACTION TAKEN. HOWEVER, FACTORY WAS INFORMED OF THE RESULT OF THIS FAILURE ANALYSIS. ALSO FAILURE ANALYSIS PEOPLE TO BE CALLED IN TO WITNESS A FAILURE IN THE SAME MODE SHOULD ONE OCCUR. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | SLV-99-20-3083F TRANSDUCER | FAR 89-43203-502 | 851100 | FACTORY | | ACOUSTICA | 890433 |
| FAILURE MODE-STRUCTURAL. DEFECTIVE CRYSTALLINE STRUCTURE ADJACENT TO SOLDER CONNECTION CAUSED THE FAILURE. | | | | | | | |
| CORRECTIVE ACTION-VENDOR IMPROVED MATERIALS AND MANUFACTURING TECHNIQUES. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | SLV-99-20-3083F TRANSDUCER | FAR 27-04238-3 | 851100 | FACTORY | | ACOUSTICA 100290-12 | 890438 |
| FAILURE MODE-STRUCTURAL. DEFECTIVE CRYSTALLINE STRUCTURE ADJACENT TO SOLDER CONNECTION CAUSED THE FAILURE. | | | | | | | |
| CORRECTIVE ACTION-VENDOR IMPROVED MATERIALS AND MANUFACTURING TECHNIQUES. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | CT-A9-08-149 SUSTAINER PREVALVE SEAL | FAR 27-02250-3 | 850918 | FACTORY | YES NO | STRATON | 898897 |
| FAILURE MODE-LEAK-UNIT REJECTED FOR INTERNAL LEAKAGE DURING FINAL CHECKOUT. LEAKAGE WAS ATTRIBUTED TO EXCESSIVE USE OF ADHESIVE IN THE SEAL GROOVE. THE BODY BORE WAS MACHINED TOO LARGE BY THE VENDOR. | | | | | | | |
| CORRECTIVE ACTION-RAR CT-A9-08-1119 RECOMMENDS VENDOR BE REQUESTED TO TAKE APPROPRIATE ACTION TO CORRECT DISCREPANCIES FOUND. FINAL ACTION OPEN AS OF DEC. 14, 1966. | | | | | | | |

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| PROPULSION INTERFACE-A/B FUEL FEED | 60C/22H65-026-DA1057-/L4-7MO-01-71 11 SEAL | COMPOSITE-PRD/DPL 950730 | 7111 | 2-4/PALC | YES NO | 091892 |
| FAILURE MODE-LEAK, EXTERNAL. FUEL LEAK IN UNUSED BOSS JUST ABOVE AIRBORNE FILL AND DRAIN VALVE. | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | |
| CORRECTIVE ACTION-THE PLUG WAS REMOVED AND THE TORUS SEAL WAS REPLACED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69A4162 FLEX LINE ASSEMBLY, FUEL | UTP-PAT 27-22500-803 | 950822 | FACTORY | YES 60/C NO. 27-22500-803 | 091133 |
| FAILURE MODE-LEAK-EXTERNAL. LEAKAGE APPEARED WHEN THE LINE ASSEMBLY WAS EXPOSED TO THE UNDER- WATER LEAKAGE TEST WITH 1700 PSIG INTERNAL PRESSURE. A SMALL LEAK WAS LOCATED IN THE 27-22528-7 FITTING. THE RATE WAS MEASURED AT 900 PSI 6 AND WAS 1SCC IN 7 MINUTES. | | | | | | |
| CORRECTIVE ACTION-INSPECTION TO REJECT LINE ASSEMBLY FOR REWORK. PROBLEM IS INADEQUATE FACTORY QUALITY CONTROL. RADIOGRAPHIC INSPECTION OF WELD AND/OR LEAK TESTING SHOULD HAVE DETECTED PROBLEM. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69A4385 BOOSTER FUEL PREVALVE | UTP-QUAL/PPT 7-02287-1 | 950810 | FACTORY | YES HADLEY NO 10577-1 | 091113 |
| FAILURE MODE-OUT OF TOLERANCE. DURING PROOF CYCLE FOLLOWING Z-AXIS SINE-RANDOM VIBRATION WITH THE VALVE CLOSED AND PRESSURIZED TO 90 PSIG G2 THE VALVE LEAKED 893 SCCM. ALLOWABLE LEAKAGE IS 20 SCCM. REF. 8/N 304 T.H. NO. 531-1-008, NO. 4. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69A4385 BOOSTER FUEL PREVALVE | UTP-QUAL/PPT 7-02287-1 | 953809 | FACTORY | YES B.H. HADLEY NO 10577-1 | 091892 |
| FAILURE MODE-CUT OF TOLERANCE. DURING PROOF CYCLE FOLLOWING Y-AXIS SINE/RANDOM VIBRATION WITH THE VALVE CLOSED AND PRESSURIZED TO 90 PSIG G2 THE VALVE LEAKED 92 SCCM. ALLOWABLE LEAKAGE IS 20 SCCM. REF. 8/N 304 T.H. NO. 531-1-007, NO. 5. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |

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| PROPULSION INTERFACE-A/B FUEL FEED | CT-99-08-139 SUSTAINER PREVALVE SEAL | FAR 7-02281-13 | 650402 | FACTORY | YES NO | B.H. MADLEY 090160 |
| FAILURE MODE-LEAK-EXTERNAL. UNIT WAS REJECTED FOR EXTERNAL LEAKAGE OF NITROGEN PAST THE END BOLT. LEAKAGE CAUSED BY MISAPPLICATION OF A STATIC SEALING O RING, WHICH HAD EXTRUDED UNDER THE BOLT HEAD. | | | | | | |
| CORRECTIVE ACTION-SUSTAINER PREVALVE REPLACED WITH AN E SERIES PREVALVE, P/N 27-02250-5. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | LV-99-08-3011F BOOSTER PREVALVE ACTUATOR BRACKET | FAR 7-02287-13 | 164D 650310 | FACTORY | YES NO | B.H. MADLEY 094774 |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR THE ACTUATOR PISTON JAM NUT RUBBING THE ACTUATOR BRACKET WHEN OPERATED FROM OPEN TO THE CLOSED POSITION. ABOVE CONSIDERED TO BE CAUSED BY AN IMPROPERLY DIMENSIONED VENDOR DRAWING. | | | | | | |
| CORRECTIVE ACTION-VENDOR WILL REVISE DRAWING FOR ADDITIONAL ORDERS. SURVEY 25-85 CALLED FOR INSPECTION, AND REMOVAL OF ALL VALVES. REMOVAL OF ACTUATOR IS UNDER CONSIDERATION. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | CT-98-06-131 STAGING VALVE-FUEL | FAR 7-02229-13 | 158D 650302 | 36A/ETR | YES YES | THICKOL 311193 090169 |
| FAILURE MODE-PREMATURE OPERATION. UNIT SUSPECTED OF PREMATURE DISENGAGEMENT FOR SOME CAUSE, OR LACK OF COMPLETE ENGAGEMENT PERMITTING PARTIAL CLOSING OF THE POPPET AND RESULTANT HIGH DIFFERENTIAL PRESSURE ACROSS THE POPPET. POINT L CHA TESTS INDICATED SUCH A CONDITION YIELDS THE SPIDER BEFORE THE ADAPTER WALLS COLLAPSE. THE LACK OF SPIDER YIELDING, APPARENT IN THE VALVE FROM 158D, INDICATED NO DESTRUCTIVE FORCE WAS APPLIED THROUGH THE POPPET TO THE SPIDER. | | | | | | |
| CORRECTIVE ACTION-MINIMUM POPPET OPENING ESTABLISHED AT 1.60 INCHES. MAXIMUM OPENING WILL BE ESTABLISHED BY A PROBE CLEARANCE MINIMUM OF 0.25 INCH. ALL INSTALLED VALVES WERE X-RAYED TO DETERMINE POPPET OPENING, IF LESS THAN 1.60 INCHES A 0.125 INCH SPACER WAS INSTALLED BETWEEN BOOSTER HALF FLANGE AND THE LOW PRESSURE DUCT FLANGE. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | CT-98-06-140 MANIFOLD DUCT | FAR 7-23419 | 158D 450302 | 36A/ETR | NO YES | 60/C 090160 |
| FAILURE MODE-STRUCTURAL-THIS DUCT WAS ANALYZED TO DETERMINE IF IT CONTAINED ANY PHYSICAL DISCREPANCIES PRIOR TO THE ACCIDENT. ALL ANALYSIS RESULTS SHOW THE DUCT WAS IN ACCORDANCE WITH 60/C BLUEPRINT SPECIFICATIONS. SEE FAR CT-98-08-131. | | | | | | |
| CORRECTIVE ACTION-NONE | | | | | | |

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| PROPULSION INTERFACE-A/B FUEL FEED | 60/C-BN285-018 FUEL STAGING VALVE | FLIGHT | 196D 850302 | 38A/ETR 1 | YES YES | | 894789 |
| <p>FAILURE MODE-FAIL DURING OPERATION. FUEL STARVATION TO THE BOOSTER ENGINE WAS POSSIBLY CAUSED BY AN INADVERTENT CLOSING OF THE FUEL STAGING VALVE DUE TO UNDETERMINED CAUSE.</p> <p>SYSTEM EFFECT-OPERATION STOPS PREMATURELY. CLOSURE OF THE STAGING VALVE RESULTED IN FUEL STARVATION OF THE BOOSTER ENGINE.</p> <p>VEHICLE EFFECT-PREMATURE BOOSTER ENGINE SHUTDOWN. LOSS OF BOOSTER ENGINE THRUST RESULTED IN PREMATURE FLIGHT TERMINATION AND DESTRUCTION OF THE VEHICLE.</p> <p>CORRECTIVE ACTION-A NEW MINIMUM INSTALLED FUEL STAGING VALVE POPPET OPENING OF 1.60 INCHES HAS BEEN ESTABLISHED. AN X-RAY PROCEDURE HAS BEEN INSTITUTED TO DETERMINE FUEL STAGING VALVE POPPET OPENING. A STANDARD 0.125 INCH SPACER IS BEING ADDED TO RAISE THE POPPET IN VEHICLES WHICH HAVE A POPPET OPENING VALVE BELOW THE NEW MINIMUM.</p> | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 60/C-BN285-018 BOOSTER FUEL PREVALVE | FLIGHT | 196D 850302 | 38A/ETR 1 | YES YES | | 894789 |
| <p>FAILURE MODE-FAIL DURING OPERATION. FUEL STARVATION TO THE BOOSTER ENGINE WAS POSSIBLY CAUSED BY INADVERTANT CLOSING OF THE FUEL PREVALVE. CAUSE OF CLOSING IS UNKNOWN.</p> <p>SYSTEM EFFECT-CLOSURE OF THE PREVALVE RESULTED IN FUEL STARVATION OF THE BOOSTER ENGINE.</p> <p>VEHICLE EFFECT-PREMATURE BOOSTER ENGINE SHUTDOWN. LOSS OF BOOSTER ENGINE THRUST RESULTED IN PREMATURE FLIGHT TERMINATION AND DESTRUCTION OF THE VEHICLE.</p> <p>CORRECTIVE ACTION-THE BOOSTER FUEL PREVALVE HAS BEEN REPLACED BY A MANUAL VALVE AND IS BOLTED IN THE OPEN POSITION. THE SUSTAINER FUEL PREVALVE HAS BEEN REPLACED BY A MANUAL E SERIES VALVE. ALL PNEUMATIC CONTROL OF PREVALVES HAS BEEN DEACTIVATED. ANY ENGINE DRAIN PROCEDURE WITH FUEL IN THE MAIN TANK HAS BEEN DISALLOWED.</p> | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | LV-98-06-3010F DUCT | FAR 7-23419-801 | 196D 850128 | 12/E1R | YES NO | 60/C | 893170 |
| <p>FAILURE MODE-LEAK-EXTERNAL. THE BOOSTER TURBOPUMP DUCT WAS REJECTED FOR AN EXTERNAL LEAK AT A WELD JOINT. CAUSED BY IMPROPER WELDING.</p> <p>CORRECTIVE ACTION-WELDING PERSONNEL REQUESTED TO REVIEW WELD SCHEDULES AND ELIMINATE SUCH WELDS IN THE FUTURE.</p> | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | BLV-99-08-3002F CHECK VALVE-SPRING | FAR 7-02337-1 | 7112 841109 | FACTORY | YES NO | CIRCLE SEAL 889A-87T | |
| <p>FAILURE MODE-OUT OF TOLERANCE- START TANK VENT LINE CHECK VALVE REJECTED FOR AN INTERNAL LEAK. THIS WAS CAUSED BY A POPPET SPRING BEING INSTALLED ON THE WRONG SIDE OF THE POPPET. THIS VALVE HAD BEEN REMOVED PER SURVEY 118-64.</p> | | | | | | | |

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| | | | | | | | 093141 |
| | CORRECTIVE ACTION-FACTORY PERSONNEL CAUTIONED TO USE GREATER CARE IN SUCH INSTANCES. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | SLV-90-08-3003F VERNIER ENGINE FEED LINE-ORIFICE | FAR 80-28122-803 | 641104 | WTR/ETR | YES NO | | 093863 |
| FAILURE MODE-OUT OF TOLERANCE. TEN ELBOW-ORIFICE ASSEMBLIES REJECTED, EIGHT AT WTR AND TWO AT ETR, FOR ORIFICE PLAT E TILT, INADEQUATE ROLLOVER AND DAMAGED SURFACES. ABOVE CONFIRMED AND CONSIDERED THE RESULT OF IMPROPER PLANNING, PR OCEDURES AND WORKMANSHIP. | | | | | | | |
| | CORRECTIVE ACTION-PLANNING REVISED AND PERSONNEL CAUTIONED TO USE GREATER CARE IN ASSEMBLY AND INSPECTION OPERATION S. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | SLV-99-06-3004F Y/E SUPPLY LINE FLANGE BOLTS | FAR 27-28404-3 | 7112 641103 | FACTORY | YES NO | 60/C | 093176 |
| FAILURE MODE-STRUCTURAL-UNIT REJECTED WHEN FIVE OF EIGHT ATTACH BOLTS SHEARED OFF ON REMOVAL. CAUSE WAS DETERMINED TO BE THE RESULT OF USING NO LUBRICANT ON INSTALLATION OF THE STAINLESS STEEL BOLTS IN A STAINLESS STEEL BODY. | | | | | | | |
| | CORRECTIVE ACTION-60/C DOCUMENTATION REVISED CALLING FOR USE OF A LUBRICANT. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | SLV-90-08-3007F SUSTAINER PREVALVE | FAR 7-02281-13 | 7103 641026 | WTR | YES NO | B. M. MADLEY | 094363 |
| FAILURE MODE-FAIL DURING OPERATION. UNIT REJECTED FOR FAILURE TO CLOSE. FAILURE WAS NOT CONFIRMED. HOWEVER, A TORN TEFLON O RING WAS FOUND AND THE LOOSE PIECE COULD HAVE LOGGED BETWEEN THE PISTON AND THE END OF THE BORE AND PREVENT ED FULL TRAVEL OF THE PISTON. | | | | | | | |
| | CORRECTIVE ACTION-NONE. CAUSE OF FAILURE COULD NOT BE DETERMINED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | LV-9A-08-298F SUSTAINER PREVALVE SWITCH | FAR 7-02281-13 | 353D 640923 | FACTORY | YES NO | B. M. MADLEY 10376-13 | |
| FAILURE MODE-ERRATIC OPERATION. UNIT REJECTED FOR ERRATIC OPERATION OF THE CLOSED POSITION MICROSWITCH. CAUSE WAS F OUND TO BE LACK OF SWITCH MOUNTING SCREWS, WHICH ALLOWED THE SWITCH TO SHIFT POSITION AND NOT BE ACTUATED BY ACTUATI NG LEVER. | | | | | | | |

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| CORRECTIVE ACTION-VENDOR ADVISED MISSING SCREWS WERE THE RESULT OF AN ASSEMBLERS OVERSIGHT. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | SLV-99-08-296F START TANK VENT LINE CHECK VALVE P 7-02397-1 OPPET | FAR | 7108 | FACTORY | YES | CIRCLE SEAL NO 889A87T |
| FAILURE MODE-LEAK-UNIT REJECTED FOR INTERNAL LEAKAGE AFTER REMOVAL PER SURVEY 118-84. POPPET WAS STUCK BUT SLAMMED & SHUT AT 25 PSIG AND OPERATED SATISFACTORILY THEREAFTER. PROBLEM CONSIDERED DUE TO MIGRATORY CONTAMINATION WHICH COULD NOT BE FOUND. | | | | | | |
| CORRECTIVE ACTION-NONE. CONTAMINANT COULD NOT BE FOUND. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69A2845.4 FUEL FILL AND DRAIN VALVE MOTOR | UTP-PRT 7-02315-801 | 640918 | FACTORY | YES | AIRESEARCH NO 303610-1-1 |
| FAILURE MODE-FAIL TO OPERATE. FOLLOWING PRT TEMPERATURE-VIBRATION IN X-AXIS THE BUTTERFLY VALVE MOTOR WOULD NOT OPERATE. THE MOTOR ARMATURE SHOWED AN OPEN CIRCUIT BETWEEN COMMUTATOR SEGMENTS 4 AND 5 AND 14 AND 15. REF. 3/N 311-0632 T.M. NO. 1. | | | | | | |
| CORRECTIVE ACTION-TESTING STOPPED. NO DESIGN CHANGE INITIATED SINCE VALUE IS NOT OPERATED IN FLIGHT. REF. RTFM FPM NO F-4346 3T AND F.R NO. FR 654-2-400. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69H-1960.2/15989 BOOSTER FUEL SHUT-OFF VALVE, SEAL | UTP-SLT 7-02287-15 | 640826 | | YES | HADLEY NO 10377-15 |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE FINAL ACCEPTANCE PROOF CYCLE WITH THE VALVE CLOSED AND PRESSURIZED TO 10 PSIG GND, THE VALVE LEAKED 315 SCCM. ALLOWABLE LEAKAGE IS 15 SCCM. REPEATED ACTUATIONS OF THE VALVE DID NOT DECREASE THE LEAKAGE. FAILURE ANALYSIS OF THE TEST VALVE REVEALED A DENT IN THE TEFLON BUTTERFLY SEAL. REF. 3/N 401-0286 T.M. NO. H43403-11. | | | | | | |
| CORRECTIVE ACTION-TESTING STOPPED. INVESTIGATION INDICATED THE DENT OCCURRED IN HANDLING THE VALVE. THE TEST AGENCY WAS INFORMED OF THE NEED TO IMPROVE THEIR COMPONENT HANDLING PROCEDURES. REF. RTFM FPM NO F-4341-3T AND FPM NO. FR-654-2-362. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69H-1960.2/15989 BOOSTER FUEL SHUT-OFF VALVE | UTP-SLT 7-02287-15 | 640826 | | YES | B.M. HADLEY NO 10377-15 |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE POST SLT LOW TEMPERATURE VIBRATION PROOF CYCLE WITH THE VALVE CLOSED AND PRESSURIZED TO 10 PSIG GND, THE VALVE LEAKED 300 SCCM. ALLOWABLE LEAKAGE IS 15 SCCM. REF. 3/N 401-0286 T.M. NO. H 43406-10. | | | | | | |

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF TIME | SITE DIF TIME | PRI OTH | VENDOR NAME VENDOR PART NO |
|---|---|--------------------------------|--------------------------|------------------|--------------------------------|-------------------------------|
| CORRECTIVE ACTION-NONE. REF. RTFH FPR NR P-4341-ST AND FPR NO. FR-654-2-382. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69M-1980-2/15989 BOOSTER FUEL SHUT-OFF VALVE | UTP-SLT 7-02287-13 | 640825 | | YES B.H. MADLEY NO 10377-13 | |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE POST SLT HIGH TEMPERATURE VIBRATION PROOF CYCLE WITH THE VALVE CLOSED AND PRESSURIZED TO 10 PSIG G#2, THE VALVE LEAKED 370 SCCM. ALLOWABLE LEAKAGE IS 15 SCCM. REF. S/N 401-0288 T.H. NO. M43403-9. | | | | | | |
| CORRECTIVE ACTION-NONE. REF. RTFH FPR NR P-4341-ST AND FPR NO. FR-654-2-102. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69M-1980-2/15989 BOOSTER FUEL SHUT-OFF VALVE | UTP-PRT 7-02287-13 | 640824 | | YES B.H. MADLEY NO 10377-13 | |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE POST EXPLOSION PROOF TEST PROOCYCLE WITH THE VALVE CLOSED AND PRESSURIZE D TO 10 PSIG G#2, THE VALVE LEAKED 50 SCCM. ALLOWABLE LEAKAGE IS 15 SCCM. REF. S/N 401-0288 T.H. NO. M-43403-7. | | | | | | |
| CORRECTIVE ACTION-NONE. REF. RTFH FPR NRP-4341-ST AND FPR NO. FR-654-2-382. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69M-1980-2/15989 BOOSTER FUEL SHUT-OFF VALVE | UTP-PRT 7-02287-13 | 640821 | | YES MADLEY NO 10377-13 | |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE POST PRT TEMPERATURE VIBRATION PROOF CYCLE WITH THE VALVE CLOSED AND PRES SURIZED TO 10 PSIG G#2, THE VALVE LEAKED 1000 SCCM. ALLOWABLE LEAKAGE IS 15 SCCM. WITH VALVE PRESSURIZED TO 80 PSIG R P-1 FUEL, THE LEAKAGE WAS 37.2 SCCM. ALLOWABLE LEAKAGE IS 20 SCCM. REF. S/N 401-0288 T.H. NO. M43403-8. | | | | | | |
| CORRECTIVE ACTION-CYCLE VALVE AND RECHECK LEAKAGE. CONTINUE TESTING. REF. RTFH FPR NR P-4341-ST AND FPR NO. FR-654-2-382. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69M-1980-2/15989 BOOSTER FUEL SHUT-OFF VALVE | UTP-PRT 7-02287-13 | 640820 | | YES B.H. MADLEY NO 10377-13 | |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE POST PRT-LOW TEMPERATURE VIBRATION PROOF CYCLE WITH THE VALVE CLOSED AND PRESSURIZED TO 10 PSIG G#2, THE VALVE LEAKED 25 SCCM. ALLOWABLE LEAKAGE IS 15 SCCM. REF. S/N 401-0288 T.H. NO. M43403-4. | | | | | | |

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| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO | |
|----------------------|--|--------------------------------|---------------------|------------------|-----------------------|-------------------------------|--------|
| | | | | | | | 890846 |
| | CORRECTIVE ACTION-NONE. REF. RTN FPR NR F-4341-ST AND FPR NO. FR654-E-382. | | | | | | |
| | PROPULSION INTERFACE-A/B SLV-90-08-291F FUEL FEED VERNIER ENGINE SUPPLY LINE ORIFICE 60-22122-803 | FAR | 7102 640818 | WTR | YES 60/C NO | | 893734 |
| | FAILURE MODE-OUT OF TOLERANCE. ELBOW ASSEMBLY REJECTED FOR A LOOSE ORIFICE PLATE. ORIFICE PLATE OUTSIDE DIAMETER WAS UNDER SIZE AND OUT-OF-ROUND AND ORIFICE WAS UNDER SIZE. | | | | | | |
| | CORRECTIVE ACTION-SURVEY 108-84 CHECKED ALL INSTALLED ORIFICES. ORIFICE AND ELBOW REDESIGNED FOR FUTURE INSTALLATION. | | | | | | |
| | PROPULSION INTERFACE-A/B 69A2645.3 FUEL FEED FUEL FILL AND DRAIN VALVE MOTOR | UTP-FR1 7-02315-801 | 640817 | FACTORY | YES AIRRESEARCH NO | 393610-1-1 | 891719 |
| | FAILURE MODE-FAIL TO OPERATE. FOLLOWING PRT TEMPERATURE-VIBRATION IN AXIS 1 VALVE WOULD NOT OPEN DUE TO CONCEALED DAMAGE AT BASE OF MOTOR COVER AND NO CONTINUITY ACROSS THE COMMUTATOR SEGMENTS. BREAKAGE WAS DUE TO THE EXCESSIVE LOADS RESULTING FROM RANDOM-SINE VIBRATION ABOVE DESIGN LEVELS. REF. S/N 310-0830 P.H. NO.1. | | | | | | |
| | CORRECTIVE ACTION-TESTING STOPPED. NO DESIGN CHANGE INITIATED SINCE VALVE IS NOT OPERATED IN FLIGHT. REF. RTN FPR NR F-4339 ST AND FPR NO.FR 654-2-245. | | | | | | |
| | PROPULSION INTERFACE-A/B 60A/BK164-339/P2-48N-01-195 FUEL FEED BOOSTER FUEL PRE-VALVE, SEAL | COMPOSITE-FRD/DPL | 195D 640813 | 12/ETR | YES NO | | 897600 |
| | FAILURE MODE-LEAK-EXTERNAL. DURING LEAK CHECKS AFTER FUEL TANKING A FUEL LEAK WAS FOUND TO EXIST IN THE BOOSTER PRE-VALVE SEAL. | | | | | | |
| | SYSTEM EFFECT-NONE. | | | | | | |
| | VEHICLE EFFECT-COUNTDOWN RESCHEDULED. | | | | | | |
| | CORRECTIVE ACTION-FUEL WAS DRAINED AND PRE-VALVE SEAL WAS REPLACED. | | | | | | |
| | PROPULSION INTERFACE-A/B LV-98-04-299F FUEL FEED BOOSTER PREVALVE GASKET | FAR | 195D 640813 | ETR | YES 60/C NO | | |
| | FAILURE MODE-LEAK-EXTERNAL. PART REJECTED FOR EXTERNAL LEAKAGE AT THE VALVE-TO-TANK PLANNED JOINT. ALTHOUGH THE GASKET WAS NICKED AND MARRED THE LEAK WAS CAUSED BY LOW ATTACH BOLT TORQUE. | | | | | | |

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| SYSTEM A/B-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO |
|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-FINAL CHECKOUT PERSONNEL WERE REQUESTED TO CHECK BOLT TORQUE AFTER ENGINE 61MB/LING TESTS. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69H-1980-2/15969 BOOSTERFUEL SHUT-OFF VALVE, SEALANT | UTP-PRT 7-02287-13 | 640811 | | YES NO | MADLEY 10377-15 |
| FAILURE MODE-OUT OF TOLERANCE. SUBSEQUENT TO PRT ROOM TEMPERATURE AXIS 1 VIBRATION, THE EPOXY RESIN COVERING THE BUTTERFLY RETAINING PINS WAS FOUND SOFTENED, ERODED AND IN TWO LOCATIONS COMPLETELY FREE OF THE HOLES. FAILURE ANALYSIS OF EPOXY REVEALED A LOW SHORE D SCALE HARDNESS READING. REF. S/N 401-0266 T.H. NO. H43403-3. | | | | | | |
| CORRECTIVE ACTION-EPOXY REPLACED AND TESTING CONTINUED. ALL PREVALVES OF THIS LOT WERE SURVEYED AND CORRECT EPOXY 1 INSTALLED. REF. RTN FPN NR F-4336-ST, FRR NO. FR 834-2-371, AND SURVEY 134-64. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69H-1980-2/15969 BOOSTERFUEL SHUT-OFF VALVE, SWITCH | UTP-PRT 7-02287-15 | 640807 | FACTORY | YES NO | MADLEY 10377-15 |
| FAILURE MODE-TEMPERATURE OPERATION. DURING THE LAST 40 SECONDS OF PRT ROOM TEMPERATURE AXIS 1 VIBRATION, THE MICROSWITCH INDICATED VALVE CLOSED WHILE THE VALVE WAS STILL OPEN. THE SWITCH COULD NOT BE ACTUATED EXTERNALLY, IT WAS JAMMED. FAILURE ANALYSIS OF FAILED SWITCH DISCLOSED FAILED SWITCH RETAINING PIN. REF. S/N 401-0266 T.H. NO. H-43403-2. | | | | | | |
| CORRECTIVE ACTION-TESTING STOPPED. VALVE RETURNED TO VENDOR FOR SWITCH REPLACEMENT AND RETURNED TO TEST LAB. VENDOR QC IMPROVED IN SWITCH MECHANISM AREA. REF. RTN FPN NR F-4336-ST AND FRR NO. FR 834-2-368. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 3LV-90-08-294F CHECK VALVE POPPET | FAR 7-02337-1 | 7102 6408C4 | WTR | YES NO | CIRCLE SEAL |
| FAILURE MODE-LEAK-UNIT REJECTED FOR INTERNAL LEAKAGE CAUSED BY A STUCK POPPET, PARTIALLY OPEN, BY CONTAMINATION AS RESULT OF USING INVELCO NO.33 LUBRICANT BY THE VENDOR. FIVE OTHER VALVES FROM THIS VENDOR SHOWED EVIDENCE OF SIMILAR CONTAMINATION. 3 OTHER CASES REPORTED IN FAR 8LV-99-08-297F. CHECK VALVE IN START TANK VENT LINE. | | | | | | |
| CORRECTIVE ACTION-SURVEY 118-64 REQUIRED REMOVAL OF ALL INVELCO NO.33 LUBRICANT FROM CHECK VALVES. VENDOR CHANGED THE LUBRICANT TO LOX-SAFE AS OF NOV. 1, 1964. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69H-1955-2/15889 SUSTAINER FUEL PREVALVE | UTP-SLT 7-02281-15 | 640722 | | YES NO | MADLEY 10378-15 |
| FAILURE MODE-OUT OF TOLERANCE. DURING POST FLT LOW TEMPERATURE VIBRATION PROOF CYCLE WITH THE VALVE CLOSED AND PRESURIZED TO 10 PSIGG2, THE VALVE LEAKED 220 SCCH. ALLOWABLE LEAKAGE IS 15 SCCH. FAILURE ANALYSIS REVEALED THREE SMALL GRASS PARTICLES IMBEDDED IN THE TEFLON SEAL. REF. S/N 208-0808 T.H. NO. H-43402-8. | | | | | | |

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|--|---|--------------------------------|---------------------|------------------|-----------------------------|-------------------------------|--------|
| | | | | | | | 001003 |
| CORRECTIVE ACTION-NO BRASS IS USED IN THE VALVE, THEREFORE THE PARTICLES WERE PROBABLY CONVEYED BY THE FUEL USED FOR PROOF CYCLES. TEST LAB PRECAUTIONS HAVE BEEN TAKEN. REF. FOR MR F-4332-8T AND FRR NO. FR 634-2-332. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 89M1928.2/18119 FUEL LINE DISCONNECT | UTP-PRT 27-21136-3 | 640722 | | YES GO/C NO 27-21136-3 | | 001004 |
| FAILURE MODE-STRUCTURAL. DURING HIGH TEMPERATURE (1800 DEGREES F) SINUSOIDAL VIBRATION, THE WELDED CROSS MEMBERS SUSTAINED CONSIDERABLE DAMAGE. THE WELD HOLDING THE CAP WAS BROKEN IN TWO PLACES AND THE CROSS MEMBERS TWISTED CONSIDERABLE. REF. S/N 403-0824 T.M. H-43404-1. | | | | | | | |
| CORRECTIVE ACTION-TESTING STOPPED. FAILURE ANALYSIS CONDUCTED. SURVEY NO. 90-64 WAS CONDUCTED ON ALL FUEL STAGING DISCONNECTS TO INSPECT FOR IMPROPER WELDING. MANUFACTURING METHODS AND QUALITY CONTROL WAS IMPROVED. REF. FRR NR F-4331-3T AND FRR-634-2-331. | | | | | | | 001002 |
| PROPULSION INTERFACE-A/B FUEL FEED | 89M-1935.2/15089 SUSTAINER FUEL PREVALVE | UTP-SLT 7-02281-15 | 640721 | | YES HADLEY NO 10576-15 | | |
| FAILURE MODE-OUT OF TOLERANCE. DURING POST SLT VIBRATION PROOF CYCLE WITH THE VALVE CLOSED AND PRESSURIZED TO 10 PSIG GAGE, THE VALVE LEAKED 24 SCCM. ALLOWABLE LEAKAGE IS 15 SCCM. FAILURE ANALYSIS REVEALED THREE SMALL PARTICLES IMBEDDED IN THE TEFLON SEAL. REF. S/N 209-0808 T.M. NO. H-43402-8. | | | | | | | |
| CORRECTIVE ACTION-NO BRASS IS USED IN THE VALVE, THEREFORE THE PARTICLES WERE PROBABLY ADMITTED BY THE FUEL USED FOR PROOF CYCLE. TEST LAB PRECAUTIONS HAVE BEEN TAKEN. REF. FRR NR F-4332-8T AND FRR NO. FR 634-2-332. | | | | | | | 001008 |
| PROPULSION INTERFACE-A/B FUEL FEED | 89A-2032-1 FUEL LINE ASSEMBLY, FUEL | UTP-PAT 27-22300-803 | 640709 | FACTORY | YES GO/C NO 27-22300-803 | | |
| FAILURE MODE-LEAK EXTERNAL. DURING THE POST VIBRATION TEST PROOF CYCLE, THE SPECIMEN LEAKED AS FOLLOWS- A. AT 1800 PSIG, LEAKAGE 125 PSIG IN 30 MINUTES B. AT 850 PSIG, LEAKAGE 30 PSIG IN 60 MINUTES. | | | | | | | |
| CORRECTIVE ACTION-NONE. CONTINUE TESTING. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | LV-49-08-285F FUEL DEPLETION SENSOR CONTROLLER C APACITOR | PAR | 1510 640830 | FACTORY | YES DELAVAN NO 16739 | | |
| FAILURE MODE-SHORT - ELECTRICAL. UNIT REJECTED FOR FAILURE TO SHOW A DRY INDICATION. FAILURE WAS TRACED TO A SHORT IN A C-9 CAPACITOR. | | | | | | | |

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| | CORRECTIVE ACTION-VENDOR INITIATED 100 PCT INSPECTION OF CAPACITORS UPON RECEIPT AND PRIOR TO SEALING THE UNIT IN THE ENCLOSURE. | | | | | | 091250 |
| PROPULSION INTERFACE-A/B FUEL FEED | LV-99-08-280F DEPLETION CONTROLLER CAPACITOR | FAR | 640320 | FACTORY | YES | DELAVAN NO | 090104 |
| FAILURE MODE-FAIL DURING OPERATION, UNIT REJECTED, DURING AN ENGINEERING EVALUATION TEST, FOR REQUIRING AN EXCESSIVE VOLTAGE INPUT FOR THE REQUIRED OUTPUT. CAUSE WAS DETERMINED TO BE THE RESULT OF CHANGE IN CAPACITOR VALUE. 1 ADDITIONAL CASE REPORTED ON FAR LV-99-08-287F. | | | | | | | |
| CORRECTIVE ACTION-CR03 AND CR06 CAPACITORS WERE DELETED FROM THE PREFERRED PARTS LIST AND REPLACED BY MIL-C-11015C CERAMIC CAPACITORS. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 27A3537 FUEL FILL AND DRAIN VALVE | UTP-PET 7-02315-801 | 640327 | FACTORY | YES | AIRESEARCH NO 393610-1-1 | 091710 |
| FAILURE MODE-OUT OF TOLERANCE. DURING WATER PROOF TEST FOLLOWING VIBRATION TEST, THE VALVE CLOSING TIME WAS 6.21 SECS. US MAXIMUM ALLOWED OF 5.00 SECONDS WITH 16 VOLT OPERATING VOLTAGE. NOTE-WATER ENTERED THE ACTUATOR MOTOR THROUGH AN UNSEALED LOCATOR NOTCH IN THE MOTOR HOUSING. REF. 3/M03-0864 T.M. NO. 1. | | | | | | | |
| CORRECTIVE ACTION-THE ACTUATOR MOTOR WAS OPENED AND DRIED PRIOR TO CONTINUING THE TEST. THE WATER SUBMERSION REQUIREMENTS WERE REMOVED FROM THE SPECIFICATION REQUIREMENTS. REF. FPR NR F-3112-SMT AND FPR NO. FR 854-2-309. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69M-1995.1/15635 SUSTAINER FUEL PNEUMATIC | UTP-SLT 7-02201-15 | 640321 | OTHER | YES | B.H.HADLEY NO 10378-15 | 091600 |
| FAILURE MODE-OUT OF TOLERANCE. DURING POST LOW-TEMPERATURE VIBRATION PROOF CYCLE WITH THE VALVE CLOSED AND PRESSURE INCREASED TO 10 PSIG THE VALVE LEAKED 482 SCCM. ALLOWABLE LEAKAGE IS 15 SCCM. REF. 3/M 292 T.M. NO. 2842-12. | | | | | | | |
| CORRECTIVE ACTION-NONE. EXAMINATION OF THE VALVE DURING THE DCA PROGRAM REVEALED NO ABNORMALITIES. REPORTED FAILURE IS CONTRIBUTED TO POOR TESTING TECHNIQUE. REF. R/FN-FPR NR F-4319-ST AND FPR NO. FR-854-2-335. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69M1928.1/15629 FUEL LINE DISCONNECT O-RING | UTP-PRT 7-02229-13 | 640315 | OTHER | YES | THICKOL NO 311193 | |
| FAILURE MODE-FAIL DURING OPERATION. DURING HIGH TEMPERATURE VIBRATION OFFSET CONNECT THE O-RING WAS FORCED OUT OF THE GROOVE AND DAMAGED. DURING THE ENGAGING PORTION OF TEST THE BELLOWS ASSEMBLY OF THE AFT SECTION ASSUMED A SET ON ONE SIDE AFTER IT WAS REMOVED FROM THE FIXTURE. RLV. 3/M 218-0316 T.M. H-42830-5. ALSO USED ON MA-2 SYSTEM (CODE A02). | | | | | | | |

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|---------------------------------------|---|--------------------------------|---------------------|------------------|---------------------------------|-------------------------------|--------|
| | | | | | | | 002123 |
| | CORRECTIVE ACTION-THE O-RING WAS REPLACED AND THE TEST CONTINUED (RERUN). REF. RTFN-FPR NR P-4289-ST AND FPR NO FR-634-2-300. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69M1980.1/15829 FUELLINE DISCONNECT, SEAL | UTP-PRT 27-21136-3 | 640515 | | YES GO/C NO | 27-21136-3 | 001697 |
| | FAILURE MODE-FAIL DURING OPERATION. DURING HIGH TEMPERATURE VIBRATION OFFSET CONNECT, THE O-RING WAS FORCED OUT OF THE GROOVE AND DAMAGED. DURING THE ENGAGING PORTION OF TEST THE BELLOWS ASSEMBLY OF THE APT SECTION ASSUMED A SET ON ONE SIDE AFTER IT WAS REMOVED FROM THE FIXTURE. REF. 8/N 308-0214 T.H. NO. H-42839-5. | | | | | | |
| | CORRECTIVE ACTION-THE O-RING WAS REPLACED AND THE TEST CONTINUED (RERUN). REF. RTFN-FPR NR P-4289-ST. AND FPR NO. F R-634-2-300. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69M-1980.1 BOOSTER FUEL SHUT-OFF VALVE | UTP-SLT 7-02267-13 | 640508 | OTHER | YES B.H. MADLEY NO 10377-15 | | 000643 |
| | FAILURE MODE-OUT OF TOLERANCE. DURING THE POST PROOF PRESSURE PROOF CYCLE WITH THE VALVE CLOSED AND PRESSURIZED TO 10 PSIG G ₂ , THE VALVE LEAKED 100 SCCM. ALLOWABLE LEAKAGE IS 15 SCCM. REF. 8/N 210-0236 T.H. NO. H-43276-14. | | | | | | |
| | CORRECTIVE ACTION-TESTING COMPLETED. UNIT TO UNDERGO FAILURE ANALYSIS. REF. RTFN FPR NR P-4277-ST AND FPR FR-634-2-255.-279. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69M-1980.1 BOOSTER FUEL SHUT-OFF VALVE | UTP-PRT 7-02267-13 | 640507 | | YES B. H. MADLEY NO 10377-15 | | 001720 |
| | FAILURE MODE-OUT OF TOLERANCE. DURING THE POST SAND AND DUST PROOF CYCLE WITH THE VALVE CLOSED AND PRESSURIZED TO 10 PSIG G ₂ THE VALVE LEAKED 30 SCCM. ALLOWABLE LEAKAGE IS 15 SCCM. REF. 8/N 210-0236 T.H. NO. H-43276-9. | | | | | | |
| | CORRECTIVE ACTION-REF. RTFN FPR NR P-4277-ST AND FPR FR 634-2-255. -279. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69M-1980.1 BOOSTER FUEL SHUT-OFF VALVE | UTP-SLT 7-02267-13 | 640507 | | YES MADLEY NO 10377-15 | | |
| | FAILURE MODE-OUT OF TOLERANCE. DURING THE POST 8LT-ROOM TEMPERATURE VIBRATION PROOF CYCLE WITH THE VALVE CLOSED AND PRESSURIZED TO 10 PSIG G ₂ , THE VALVE LEAKED 160 SCCM. ALLOWABLE LEAKAGE IS 15 SCCM. REF. 8/N 210-0236 T.H. NO. H-43276-13. | | | | | | |

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|--|---|--------------------------------|---------------------|------------------|-------------------------------|-------------------------------|--------|
| | | | | | | | 891722 |
| | CORRECTIVE ACTION-NONE. REF. RTFN FPR NR F-4277-ST AND FPR FR 654-2-255, -279. | | | | | | |
| PROPULSION FUEL FEED | 69N-1960.1 BOOSTER FUEL SHUT-OFF VALVE | UTP-SLT 7-02287-15 | 640507 | | YES B.N.HADLEY NO 10577-15 | | 891724 |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE POST SLT-LOW TEMPERATURE VIBRATION PROOF CYCLE WITH THE VALVE CLOSED AND PRESSURIZED TO 10 PSIG GNE, THE VALVE LEAKED 500SCCH. ALLOWABLE LEAKAGE IS 15 SCCH. REF. S/N 210-0236 T.M. NO. M-4327 8-12. | | | | | | | |
| | CORRECTIVE ACTION-NONE. REF. RTFN FPR NR F-4277-ST AND FPR FR 654-2-255, -279. | | | | | | |
| PROPULSION FUEL FEED | 69N-1960.1 BOOSTER FUEL SHUT-OFF VALVE | UTP-SLT 7-02287-15 | 640506 | | YES B.N.HADLEY NO 10577-15 | | 891725 |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE POST SLT-HIGH TEMPERATURE VIBRATION PROOF CYCLE WITH THE VALVE CLOSED AND PRESSURIZED TO 10 PSIG GNE, THE VALVE LEAKED 308SCCH. ALLOWABLE LEAKAGE IS 15 SCCH. REF. S/N 210-0236 T.M. NO. M-4332 78-11. | | | | | | | |
| | CORRECTIVE ACTION-NONE. REF. RTFN FPR NR F-4277-ST AND FPR FR 654-2-255, -279. | | | | | | |
| PROPULSION FUEL FEED | 69N-1960.1 BOOSTER FUEL SHUT-OFF VALVE | UTP-PRT 7-02287-15 | 640429 | | YES B.N.HADLEY NO 10577-15 | | 891729 |
| FAILURE MODE-OUT OF TOLERANCE. DURING POST PRT LOW TEMPERATURE-VIBRATION PROOF CYCLE WITH THE VALVE CLOSED AND PRES SURIZED TO 10 PSIG GNE, THE VALVE LEAKED 100 SCCH. ALLOWABLE LEAKAGE IS 15 SCCH. REF. S/N 210-0236 T.M. NO. M-43270-6 | | | | | | | |
| | CORRECTIVE ACTION-NONE. REF. RTFN FPR NR F-4271-ST AND FPR FR 654-2-255 AND -279. | | | | | | |
| PROPULSION FUEL FEED | 69N-1960.1 BOOSTER FUEL SHUT-OFF VALVE | UTP-PRT 7-02287-15 | 640429 | | YES HADLEY NO 10577-15 | | |
| FAILURE MODE-OUT OF TOLERANCE. DURING POST PRT HIGH TEMPERATURE VIBRATION PROOF CYCLE WITH THE VALVE CLOSED AND PRE SSURIZED TO 10 PSIG GNE, THE VALVE LEAKED 85 SCCH. ALLOWABLE LEAKAGE IS 15 SCCH. REF. S/N 210-0236 T.M. NO. M-43270-7 | | | | | | | |

[REDACTED]

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| SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | JITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO | |
|--|--|--------------------------------|---------------------|------------------|--------------------------------|-------------------------------|--------|
| CORRECTIVE ACTION-NONE. REF. RTFN FPR NR F-4251-3T AND FPR FR 634-2-289, -279. | | | | | | | 091721 |
| PROPULSION INTERFACE-A/B FUEL FEED | 99M1928-1/15029 FUEL LINE DISCONNECT | UTP-PRT 27-21138-3 | 640428 | | YES 50/C NO 27-21138-3 | | 091000 |
| FAILURE MODE-LEAK-EXTERNAL. DURING AMBIENT SLOW SPEED SCANNING SHEEP TO SINUSOIDAL VIBRATION THE SPECIMEN AT 220 CP S EMITTED A FINE SPRAY OF RP-1 FUEL FROM THE MATED SURFACES OF THE TWO HALVES OF THE DISCONNECT WHICH BECAME PROGRES SIVELY WORSE UNTIL THE TEST WAS HALTED AT 270 CPB. REF. S/N 301-0200 T.H. NO. H-42839-3. | | | | | | | |
| CORRECTIVE ACTION-TEST WAS STOPPED AND NEW TEST SPECIMEN OBTAINED. VIBRATION REQUIREMENTS WERE REVIEWED AND REDUCED . REF. RTFN-FPR NR-F-4255-3T AND FPR NO. 634-2-196. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 99M1928-1/15029 FUEL LINE DISCONNECT | UTP-PRT 7-02229-13 | 640428 | | YES THICKOL NO 311193 | | 091314 |
| FAILURE MODE-LEAK. DURING AMBIENT SLOW SPEED. SCANNING SHEEP OF SINUSOIDAL VIBRATION THE SPECIMEN EMITTED A FINE SP RAY OF RP-1 FUEL FROM THE MATED SURFACES OF THE TWO HALVES OF THE DISCONNECT. LEAK STARTED AT 220 CPB AND BECAME PRO GRESSIVELY WORSE. REF S/N 301-0301, T.H. NO. H-42839-3. | | | | | | | |
| CORRECTIVE ACTION-TEST WAS STOPPED AND NEW TEST SPECIMEN OBTAINED. VIBRATION REQUIREMENTS WERE REVIEWED AND REDUCED . REF. RTFN-FPR NR F-4255-3T AND FPR NO 634-2-196. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 99A2645-X FUELFILLANDRAINVALVE,MOTOR | UTP-ETT 7-02313-801 | 640416 | FACTORY | YES AIRSEARCH NO 393820-1-1 | | 091717 |
| FAILURE MODE-FAIL TO OPERATE. DURING ETT POST VIBRATION PROOF CYCLE S/N 309-0599 AND 311-0631 WOULD NOT OPEN WHEN 1 8 VOLTS OR 30 VOLTS WERE APPLIED. S/N 311-0633 FUNCTIONED BUT DREW IN EXCESS OF TEN AMPS MAXIMUM ALLOWABLE CURRENT. MALFUNCTIONS WERE DUE TO OPEN ACTUATOR ARMATURE WINDINGS, EXCESSIVE POTTING COMPOUND DEPOSITS AND BROKEN SOLDER CONN ECTIONS IN THE ACTUATOR.REF S/N 309-0599, 311-0631, AND 311-0633 T.H. NO. 3. | | | | | | | |
| CORRECTIVE ACTION-TESTING STOPPED. NO DESIGN CHANGE INITIATED SINCE FAILURE OF THIS TYPE WOULD NOT CAUSE AN ABORT O R HAZARDOUS FLIGHT CONDITION. REF. RTFN FPR NR F-4259 3T AND FPR NO. FR 634-2-64-243. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 31V-99-08-269F BOOSTER FUEL PRE-VALVE, SEAL | FAR 7-02287-13 | 640402 | FACTORY | YES B.M. MADLEY NO | | |
| FAILURE MODE-INTERNAL LEAK. DURING UTP PRT TESTING LEAKAGE ACROSS BUTTERFLY SEAL WAS OBSERVED. FAILURE CONFIRMED. S EAL DAMAGED IN TWO AREAS WITH MOST LIKELY CAUSE OF DAMAGE BEING MISHANDLING BY TEST LAB PERSONNEL. | | | | | | | |

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| SYSTEM SUB-SYSTEM | TEST/REF-RT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP TIME | SITE DIP TIME | PR1 OTH | VENDOR NAME VENDOR PART NO | |
|---|--|--------------------------------|--------------------------|------------------|------------|-------------------------------|--------|
| | CORRECTIVE ACTION-RAR 8LV-99-08-3893 INITIATED REQUESTING POSITIVE ACTION BE TAKEN BY LAB PERSONNEL TO PRECLUDE SEA L DAMAGE FROM HANDLING. VCAR 4284-64 STATED INSTRUCTIONS WERE GIVEN TO THE EFFECT THAT UNIT SHALL NOT BE INSTALLED, REMOVED, OR HANDLED WITH BUTTERFLY IN OPEN POSITION. | | | | | | 899001 |
| PROPULSION INTERFACE-A/B FUEL FEED | 89A2643.2 FUEL FILL AND DRAIN VALVE | UTP-RT7 7-02318-801 | 640408 | FACTORY | YES | AIRSEARCH NO 303610-1-1 | 891716 |
| FAILURE MODE LEAK. EXTERNAL. SURFACE LEAKING NOTED DOWNSTREAM OF VALVE AT END OF RTT HIGH TEMPERATURE T-AXIS VIBRATION. AMOUNT OF SEEPAGE NOT MEASURED. REF. 8/N 311-0635 T.H. NO. 2. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | LV-99-08-275C RISE-OFF DISCONNECT | FAR 27-20418-818 | 148D 640320 | FACTORY | YES | 60/C NO | 893735 |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR BEING SCORED. SCORING CAUSED BY AN OUT OF TOLERANCE RISE-OFF TOOL, USED WITH THE DISCONNECT. NO FAILURE ANALYSIS PERFORMED SINCE ENGINEERING LIAISON MADE DISPOSITION. | | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 89M-1980.1 BOOSTER FUEL SHUT-OFF VALVE | UTP-PR7 7-02287-15 | 640319 | | YES | NADLEY NO 10377-15 | 890917 |
| FAILURE MODE-OUT OF TOLERANCE. FOLLOWING INITIAL PROOF CYCLE FAILURE, THE SPECIMEN WAS ACTUATED 3 TIMES AND AGAIN RECEIVED A PROOF CYCLE. 1200 SCCM LEAKAGE WAS OBTAINED WHEN THE VALVE WAS PRESSURIZED. LEAKAGE WAS CAUSED BY A NICK IN THE SEAL. ALLOWABLE LEAKAGE IS 15 SCCM. REF. 8/N 209-0220 T.H. NO. M43276-4. | | | | | | | |
| CORRECTIVE ACTION-TESTING STOPPED FOR FAILURE ANALYSIS. SPECIMEN RETURNED TO THE VENDOR FOR REPAIRS. REF. 8/N 4199-37, FR NO FR 634-2-199 AND FAR-8LV-99-08-268-F. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 89M-1980.1 BOOSTER FUEL SHUT-OFF VALVE, SEAL | UTP-PR7 7-02287-15 | 640317 | | YES | B.H. NADLEY NO 10377-15 | |
| FAILURE MODE-OUT OF TOLERANCE. DURING INITIAL PROOF CYCLE WITH THE VALVE CLOSED, AND PRESSURIZED TO 10 PSIG 642. TM 2 VALVE LEAKED 1200 SCCM. ALLOWABLE LEAKAGE IS 15 SCCM. LEAKAGE WAS CAUSED BY A NICK IN THE SEAL. REF. 8/N 209-0220 T.H. NO. 43276-3. | | | | | | | |

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|--|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-TESTING STOPPED FOR FAILURE ANALYSIS. THE SPECIMEN WAS RETURNED TO THE VENDOR FOR REPAIRS. REF. P PR NR P-4191-ST, FRR NO P854-2-199, AND FAR-8LV-98-08-266-P. | | | | | | | 891036 |
| PROPULSION INTERFACE-A/B FUEL FEED | SLV-99-06-289F SUSTAINER FUEL PRE-VALVE, SEAL | FAR 7-02261-15 | 840313 | FACTORY | YES | B.M. MADLEY NO | 899002 |
| FAILURE MODE-INTERNAL LEAK. DURING UTP PR7/SLT RELIABILITY TESTING, GNE AND RP-1 LEAKAGE OCCURRED ACROSS BUTTERFLY SEAL. FAILURE UNCONFIRMED. NO LEAKAGE PATHS ACROSS SEAL FACE (REL-P) WERE EVIDENT. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | FTAB426/P2-4CO-03-263 BOOSTER FUEL PREVALVE | COMPOSITE-B FACT | 263D 840313 | 12/ETR 0 | YES NO | | 897695 |
| FAILURE MODE-INTERNAL LEAK-FUEL PUMP INLET PRESSURE MEASUREMENTS INDICATED THAT THE BOOSTER PREVALVE WAS LEAKING HE LIUM. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-PREVALVE REPLACED. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | AAB4-0016/P1-68N-02-137 INSTRUMENTATION BOSS | COMPOSITE-FRD/DPL | 137F 840311 | 11/ETR | YES NO | | 897466 |
| FAILURE MODE-LEAK-EXTERNAL. LEAK AT B1 FUEL PUMP INLET PRESSURE TRANSDUCER DURING SEQUENCE 2 PRESSURE. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. ACTION TAKEN PER IR 887885. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 89N-1935.1/13635 SUSTAINER FUEL PREVALVE | UTP-PRT 7-02261-15 | 840306 | | YES | MADLEY NO 12376-15 | |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE POST HIGH TEMPERATURE VIBRATION PROOF CYCLE, WITH THE VALVE CLOSED AND TH EINLET PRESSURED TO 10 PSIG GNE, MEASURED LEAKAGE WAS 750 SCCM. ALLOWABLE IS 15 SCCM. WITH VALVE PRESSURIZED TO 90 P S16, RP-1 FUEL MEASURED LEAKAGE RANGED FROM 14.0 TO 19.0 SCCM. ALLOWABLE LEAKAGE IS 9 SCCM. REF. 87N 292 T.N. NO. 26 48-7. | | | | | | | |

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|---|--|--------------------------------|---------------------|------------------|--------------------------------|-------------------------------|--------|
| CORRECTIVE ACTION-NONE. | REF. RTHN-FPR NR F-4187-8T. | | | | | | 991081 |
| PROPULSION INTERFACE-A/B | 99M1928-1/15829 FUEL LINE DISCONNECT | UTP-PRT 7-02229-13 | 640303 | | YES THICKOL NO 311193 | | 992187 |
| FAILURE MODE-LEAK-EXTERNAL. DURING AMBIENT SLOW SPEED SCANNING SHEEP OF SINUSOIDAL VIBRATION THE SPECIMEN EMITTED A FINE SPRAY OF RP-1 FUEL FROM THE MATED SURFACES OF THE TWO HALVES OF THE DISCONNECT. THE LEAK STARTED AT 200 CPS. R EP 8/M 201-0301 T.H. NO. H-42839-1. | | | | | | | |
| CORRECTIVE ACTION-NONE. | REF. RTHN-FPR NR F-4187-8T. | | | | | | 991049 |
| PROPULSION INTERFACE-A/B | 99M1928-1/15829 FUEL LINE DISCONNECT VALVE | UTP-PRT 27-21130-3 | 640303 | | YES 60/C YES 27-21130-3 | | 992187 |
| FAILURE MODE-LEAK-EXTERNAL. DURING AMBIENT SLOW SPEED SCANNING SHEEP OF SINUSOIDAL VIBRATION, THE SPECIMEN STARTING AT 200 CPS, EMITTED A FINE SPRAY OF RP-1 FUEL FROM THE MATED SURFACES OF THE TWO HALVES OF THE DISCONNECT. REF. 8/M 301-0200 T.H. NO. H-42839-1. | | | | | | | |
| CORRECTIVE ACTION-NONE. | REF. RTHN-FPR NR F-4187-8T. | | | | | | 990997 |
| PROPULSION INTERFACE-A/B | LV-98-08-271F BOOSTER FUEL PRE-VALVE, SEAL | FAR 7-02229-13 | 2830 640303 | ETR12 | YES B.M. MADLEY NO 10577-15 | | 990997 |
| FAILURE MODE-INTERNAL LEAK. LEAKAGE OCCURRED ACROSS BUTTERFLY SEAL WHILE PERFORMING T/P 27-83322 PROPELLANT LEAK CH ECK8. SEAL DAMAGE EVIDENT BUT SOURCE OF DAMAGE OR CONTAMINATION NOT RESOLVED. | | | | | | | |
| CORRECTIVE ACTION-NONE-SINCE SOURCE OF DAMAGE WAS NOT ISOLATED. | | | | | | | 990013 |
| PROPULSION INTERFACE-A/B | A-90-08-287F FUEL FILL AND DRAIN VALVE, ACTUATO 7-02315-5 | FAR 7-02315-5 | 3F 640300 | WTR | YES AIRSEARCH NO | | 990013 |
| FAILURE MODE-FAIL TO OPERATE. FAILURE TRACED TO ELEC OPEN IN ACTUATOR MOTOR. FAILURE DETERMINED TO HAVE ORIGINATED EXTERNAL TO VALVE ACTUATOR. PRIMARY FAILURE SOURCE UNDETERMINED. FAILURE OCCURRED DURING X-1 DAY CHECKOUT RESULTING IN MOTOR ARMATURE ELEC OPEN AND BUTTERFLY POSITION INDICATORS INDICATING PARTIAL OPEN. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |

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|--|---|--------------------------------|---------------------|------------------|--------------------------------|-------------------------------|--|
| PROPULSION INTERFACE-A/B FUEL FEED | LV-8D-06-262F SELF-SEALING COUPLING HALP, SEAL | FAR 81-88900-072 | 283D 840221 | WTR A-3 | YES E.B. WIGGINS NO 7005018 | 890014 | |
| FAILURE MODE-LEAK. LEAKAGE OF 30 DROPS PER MINUTE NOTED FOLLOWING DISCONNECT AFTER COMPLETION OF DPL. FAILURE CONFIRMED AND ATTRIBUTED TO GROSS CONTAMINATION OF UNIT WITH STAINLESS STEEL PARTICLES RESULTING IN CUTTING OF POPPET SEAL FACE CREATING LEAKAGE PATH. | | | | | | | |
| CORRECTIVE ACTION-SITE PERSONNEL INVESTIGATED FUEL GROUND SYSTEM FOR CLEANLINESS AND FOUND IT TO BE WITHIN SPEC. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69M-1955-1/15635 SUSTAINER FUEL PREVALVE | UTP-PRT 7-02281-15 | 840125 | | YES B.H. MADLEY NO 10576-15 | 890048 | |
| FAILURE MODE-OUT OF TOLERANCE. FOLLOWING LOW TEMPERATURE VIBRATION WITH OPEN VALVE FILLED WITH RP-1 AT 90 PSIG THE VALVE CLOSED WHEN LESS THAN 250 PSIG WAS APPLIED TO THE ACTUATOR CLOSE PORT. REF. S/N 292 T.H. NO. 2842-5. | | | | | | | |
| CORRECTIVE ACTION-TEST STOPPED FOR PROCEDURE REVIEW AND THEN CONTINUED. INVESTIGATION OF SPECIFICATION REVEALED AN IMPROPER INTERPRETATION OF SPEC REQUIREMENTS AND WAS REFLECTED IN THE TEST PROCEDURE. REF. RTFN-PFR NR F-4140-ST, ME NO 862-8, DUM'D19 AND FRR NO. FR 654-2-155. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69M-1955-1/15635 SUSTAINER FUEL PREVALVE | UTP-PRT 7-02281-15 | 840118 | | YES B.H. MADLEY NO 10576-15 | 890049 | |
| FAILURE MODE-OUT OF TOLERANCE. DURING PROOF CYCLE WITH THE VALVE IN CLOSED POSITION WITH THE INLET SIDE PRESSURIZED WITH 90 PSIG RP-1 FUEL UNDER AMBIENT CONDITIONS, THE VALVE LEAKED FROM 13.5 TO 1200 SCCM. ALLOWABLE LEAKAGE IS 5 SC CM. REF. S/N 292 T.H. NO. 2842-5. | | | | | | | |
| CORRECTIVE ACTION-TEST REPEATED BUT FAILURE COULD NOT BE DUPLICATED. TESTING CONTINUED. REF. RTFN-PFR NR F-4139-ST. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | LV-8B-06-262F GASKET, BOOSTER PRE-VALVE | FAR 7-23237-21 | 198D 840108 | ETR12 | YES NO | 890013 | |
| FAILURE MODE-LEAKAGE EXTERNAL. UNDETERMINED QUANTITY OF LEAKAGE PAST SEAL CAUSED BY WEARING OF REL-F ON SEALING SURFACE. CAUSE OF WEAR UNDETERMINED BUT COULD BE CAUSED BY SIMBALLING OF ENGINE, WITH LOOSE FLANGE BOLTS AT INTERFACE WHERE GASKET IS EMPLOYED. (FUEL BOOSTER PRE-VALVE) | | | | | | | |
| CORRECTIVE ACTION-AMP PERSONNEL PURGED AND REPLACED STOCK WITH CURRENT PRODUCTION RUN. (APRIL 1964). | | | | | | | |

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|---|---|-----------------------------------|--------------------------|---------------------|----------------|-------------------------------|
| PROPULSION INTERFACE-A/B FUEL FEED | AAS4-0002/PE-4BN-01-139 VALVE-PRE-BOOSTER FUEL | COMPOSITE-FRD/DPL 7-23237-049 | 199D 840108 | 12/ETR NO | YES NO | |
| FAILURE MODE-LEAK-EXTERNAL. LEAK OBSERVED AT BOOSTER PRE-VALVE DURING SEQUENCE TWO PRESSURIZATION. SYSTEM EFFECT-NONE. VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED. LO2 TANKING NOT CONDUCTED UNTIL NEXT DAY AFTER FUEL LEAK REPAIRED CORRECTIVE ACTION-DETANKED FUEL AND REPAIRED LEAK. REFERENCE IR 859201 AND 859202. REPLACED GASKETS IN BOTH FLANGES | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-99-08-238F MAIN SUSTAINER FUEL DUCT, BELLOWS | FAR 7-22232-933 | VARIOUS 84C100 | FACTORY NO | YES NO | |
| FAILURE MODE-CONTAMINATION (CORROSION). 37 INSTANCES OF CORRODED BELLOWS ARE COVERED IN THIS FAR. DEGREE OF CORROSION RANGED FROM SUPERFICIAL TO DEEP PITTING ON THE INNER AND OUTER PLIES OF THE BELLOWS. PROBLEM ATTRIBUTED TO DESIGN, MANUFACTURING PROCESSES, AND OPERATIONAL ENVIRONMENT. CORRECTIVE ACTION-ECR T671 APPROV. 31 AUG, 1964 REDESIGNED BELLOWS TO ELIMINATE BLEED OR WEAP HOLES. ALSO, THE BELLOWS VENDOR (SOLAR AIRCRAFT) MODIFIED MFG PROCEDURES TO PRECLUDE ENTRAPMENT OF CORROSION DEARING SOLUTION BETWEEN BELLOWS PLIES DURING MANUFACTURING. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 60A83-1374/A1-401-00-233 TANK-FUEL | FLIGHT | 233D 831218 | A-1/MTR 136PL/US | YES NO | |
| FAILURE MODE-ERRATIC OPERATION. THE ENGINE FUEL TANK PRESSURE EVIDENCED OSCILLATIONS FOR 22 SECONDS AFTER TANK RE-PRESSURIZATION AND AGAIN DURING VERNIER SOLO OPERATIONAL PERIOD. THE CAUSE IS NOT KNOWN. MAXIMUM OSCILLATIONS WERE 80 PSID PEAK-TO-PEAK. SYSTEM EFFECT-NONE. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | AAS5-0037/P1-6BN-01-137 INSTRUMENTATION BOSS | COMPOSITE-FRD/DPL 27-11661-833 | 137F 831210 | 11/ETR NO | YES NO | |
| FAILURE MODE-LEAK-EXTERNAL. LEAK AT B1 FUEL PUMP INLET PRESSURE TRANSDUCER DURING SEQUENCE 2 PRESSURE. SYSTEM EFFECT-NONE. | | | | | | |

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|---|--|--------------------------------|---------------------|-----------------|-----------------------------------|-------------------------------|
| VEHICLE EFFECT-NONE. | | | | | | |
| CORRECTIVE ACTION-UNKNOWN ACTION TAKEN PER IR 901093. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-98-06-233F FUEL PRE-VALVE | PAR 27-21200-803 | 137F 631203 | ETR12 | YES NO | |
| FAILURE MODE-INTERNAL LEAK-UNKNOWN QUANTITY OF FUEL LEAKAGE DURING CHECKOUT AT COMPLEX 12. FAILURE UNCONFIRMED. | | | | | | |
| CORRECTIVE ACTION-INFORMATION ON PAR A-98-06-3885 ISSUED REQUESTING CAREFUL HANDLING OF THIS TYPE UNIT BY AFFECTED PERSONNEL. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | LV-90-06-233F FUEL MANIFOLD | PAR 7-23419-801 | 350D 631123 | WTR | YES 50/C NO 7-23419-801 | |
| FAILURE MODE-LEAKAGE EXTERNAL. UNKNOWN QUANTITY OF FUEL LEAKAGE THROUGH WELD JOINT. ATTRIBUTED TO INITIAL HOT TEAR IN WELD JOINT DURING FABRICATION CULMINATING IN EVENTUAL FATIGUE FAILURE. ADDITIONAL CASE REPORTED ON PAR LV-90-06-247F. | | | | | | |
| CORRECTIVE ACTION-REDESIGN OF FILLET WELD AREA TO ALLOW DEEPER PENETRATION. ECN 359339 RELEASED 2 JUNE 1964. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69A2845 FUEL FILL AND DRAIN VALVE, SWITCH | UTP-SLT 7-02315-801 | 631026 | FACTORY | YES ATRERESEARCH NO 393810-1-1 | |
| FAILURE MODE-FAIL TO OPERATE. FOLLOWING SLT TEMPERATURE VIBRATION IN ONE AXIS, VALVE WOULD NOT OPERATE PROPERLY IN BOTH OPEN AND CLOSE POSITIONS. IT ALSO INDICATED LACK OF CONTINUITY THROUGH THE OPEN AND CLOSE LIMIT SWITCHES. SWITCH CONTACT BAR WAS FOUND BROKEN. REF. S/N P-104-3-08-0394 T.H. NO. 2. | | | | | | |
| CORRECTIVE ACTION-TESTING STOPPED. FAILURE INVESTIGATION CONDUCTED. NO REDESIGN BECAUSE FAILURE WOULD NOT CAUSE ABO RT OR FLIGHT FAILURE. HARDWARE ACCEPTABLE FOR FLIGHT. REF. RTFN FPR NR F-4047 8T, AND FPR NO FR 634-2-043. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 69A2845 FUEL FILL AND DRAIN VALVE | UTP-PRT 7-02315-801 | 631025 | FACTORY | YES ATRERESEARCH NO 393810-1-1 | |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. DURING PRT PROOF PRESSURE TEST THE VALVE WOULD NOT CLOSE PROPERLY UPON ACTUATION UNTIL THE HOUSING WAS LIGHTLY TAPPED. UNIT WAS AT ROOM AMBIENT CONDITIONS WITH 28 VDC APPLIED. REF. S/N P-104-3-08-0394 T.H. NO. 1. | | | | | | |

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|---|---|--------------------------------|-----------------|---------------|----------------|-------------------------------|
| CORRECTIVE ACTION-FAILURE ANALYSIS CONDUCTED FOLLOWING BLT. REF. RTFN FPR NO P-4048 ST AND FPR NO. PR 634-E-043. | | | | | | 092585 |
| PROPULSION INTERFACE-A/B FUEL FEED | D493/L3-4MO-DI-224 FUEL Y DUCT | COMPOSITE-FRD/DPL | 224D 831C19 | WTR | YES NO | 097239 |
| FAILURE MODE-EXTERNAL LEAK. MAJOR FUEL LEAK, FOUND DURING NORMAL LEAK CHECK. LEAK WAS AT Y DUCT LOCATION. | | | | | | |
| SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. | | | | | | |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED. | | | | | | |
| CORRECTIVE ACTION- FUEL LOW PRESSURE Y DUCT WAS REPLACED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | GO/A63-0965/C1-501-00-7A FUEL STAGING DISCONNECT | FLIGHT | 71E 830925 | 576C 127.5 | YES NO | 090293 |
| FAILURE MODE-FAIL DURING OPERATION. BOOSTER STAGING PROBLEM. BELIEVED CAUSED WHEN POOLS OF PROPELLANTS COLLECT IN VARIOUS PLACES DURING INITIAL PART OF STAGING AND WERE DETONATED BY SUSTAINER ENGINE FLASHBACK. | | | | | | |
| SYSTEM EFFECT-EXPLOSION. HYDRAULIC LEAK RELIEVED CAUSED BY MINOR EXPLOSION AT STAGING. | | | | | | |
| VEHICLE EFFECT-LOSS OF VEHICLE STABILITY DUE TO LOSS OF HYDRAULIC PRESSURE IN SUSTAINER SYSTEM. | | | | | | |
| CORRECTIVE ACTION-ADDED FUEL STAGING SHUTOFF VALVE TO PREVENT POOLS OF PROPELLANTS FROM FORMING. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-19-06-241F VERNIER ENGINE TANK PRESSURE TUBE SLEEVE | FAR | 830814 | FACTORY | YES 60/C NO | 093670 |
| FAILURE MODE-OUT OF TOLERANCE. UNIT REJECTED FOR A B-NUT JAMMED ON ITS SLEEVE, DUE TO THE SLEEVE BEING BELLMOUTHED AS A RESULT OF OVERTORQUE. | | | | | | |
| CORRECTIVE ACTION-60/C FACTORY PERSONNEL INFORMED OF PROBLEM. 60-N3-60 SAGES WERE PROVIDED AND TORQUE VALVES REVISED. EXIST STOCK WAS PURGED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 3P-29-08-235F HOSE ASSEMBLY FLARE | FAR | 830730 | FACTORY | YES 60/C NO | 093692 |
| FAILURE MODE-LEAK-EXTERNAL-UNIT REJECTED FOR A LEAK AT THE B-NUT CAUSED BY AN IRREGULARITY ON THE FLARED SURFACE. A DIE MARK WAS NOTED, OPPOSITE THE IRREGULARITY, ON THE OUTSIDE SURFACE OF THE FLARE. | | | | | | |
| CORRECTIVE ACTION-N.P.S. WAS REVISED TO EXPAND REQUIREMENTS FOR TUBE FLARING OPERATIONS AND INSPECTION. | | | | | | |

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|--|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B FUEL FEED | LV-9D-06-234F SUSTAINER PREVALVE ACTUATOR | FAR 7-02281-15 | 201D 630702 | FALC 2-3 | YES NO | B.H. MADLEY | 893891 |
| FAILURE MODE-ERRATIC OPERATION. REJECTED FOR CHATTERING AND SPASMODIC MOTION OF THE ACTUATOR WHILE CLOSING. THIS CONDITION IS CONSIDERED TO BE THE RESULT OF DIMENSIONAL TOLERANCE BUILDUP CAUSING INTERFERENCE BETWEEN THE PISTON, DETENT BALLS AND THE SLEEVE. | | | | | | | |
| CORRECTIVE ACTION-VENDOR REVISED DIMENSIONAL TOLERANCES TO PREVENT THIS PROBLEM IN FUTURE. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-9B-06-205F BOOSTER DUCT | FAR 27-21107-803 | 134F 630612 | STR | YES NO | GD/C | 894304 |
| FAILURE MODE-EXTERNAL LEAKAGE. LEAKAGE CONFIRMED AND OBSERVED TO ORIGINATE IN THE BELLOW SECTION. CAUSE OF LEAKAGE WAS CHEMICAL CORROSION THROUGH THE INNER BELLOW, ALLOWING FUEL TO EXIT FROM THE EXTERNAL BELLOW VENT HOLE. | | | | | | | |
| CORRECTIVE ACTION-VENDOR AND GD/C CLEANING PROCESSES REVIEWED AND PERSONNEL CAUTIONED TO USE EXTREME CARE IN PROCESSING THE BELLOWS. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | NZ-9D-06-233F SUSTAINER PREVALVE-SEAL | FAR 7-02281-15 | 198D 630602 | WTR | YES NO | B.H. MADLEY | 893890 |
| FAILURE MODE-LEAK-UNIT REJECTED FOR INTERNAL LEAKAGE CAUSED BY A SMALL DEPRESSION IN THE SEAL. THE DEPRESSION IS CONSIDERED THE RESULT OF CARELESS HANDLING. | | | | | | | |
| CORRECTIVE ACTION-REFERRED SITE PERSONNEL TO REQUIREMENTS OF CLOSING VALVE PRIOR TO REMOVAL. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | SP 9D-06-232F PREVALVE, BOOSTER-SEAL | FAR 7-02287-15 | 139D 630325 | WTR | YES NO | B.H. MADLEY | 894308 |
| FAILURE MODE-LEAK. UNIT REJECTED FOR INTERNAL LEAKAGE. LEAKAGE NOT CONFIRMED. | | | | | | | |
| CORRECTIVE ACTION-LEAKAGE NOT CONFIRMED. NO CORRECTIVE TAKEN. | | | | | | | |

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| PROPULSION INTERFACE-A/B FUEL FEED | A-A9-08-230F SUSTAINER PREVALVE-SEAL | FAR 27-02230-S | 70E 630381 | FACTORY | YES NO | STRATOS | 894314 |
| FAILURE MODE-LEAK. UNIT REJECTED FOR INTERNAL LEAKAGE CAUSED BY AN UNDERSIZE SEAL. | | | | | | | |
| CORRECTIVE ACTION-VENDOR FOUND OTHER SEALS IN STOCK WHICH WERE UNDERSIZE. SEAL VENDOR TOOK ACTION TO PREVENT FUTURE OCCURRENCES. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-99-08-211C PREVALVE, BOOSTER | FAR 27-02230-S | 62E 630308 | FACTORY | YES NO | STRATOS | 894306 |
| FAILURE MODE-LEAK. UNIT REJECTED FOR INTERNAL LEAKAGE. NO FAILURE ANALYSIS PERFORMED DUE TO LACK OF FUNDING FOR FACTORY PROBLEMS. | | | | | | | |
| CORRECTIVE ACTION-NO FAILURE ANALYSIS PERFORMED. NO CORRECTIVE ACTION TAKEN. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A063-0067DA923/L2-4MO-08-119 PRE-VALVE | COMPOSITE-PRD/DPL 7-02207-15 | 119D 630304 | 1-2/PALC | NO NO | | 097810 |
| FAILURE MODE-EXTERNAL LEAKAGE. BOOSTER FUEL PRE-VALVE FLANGE LEAK. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-RETORQUED FLANGE AND APPLIED SEALANT. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | SP-9D-08-223F PREVALVE, BOOSTER-FLANGE | FAR 7-02207-15 | 119D 630304 | 1-2/PALC | YES NO | B.H. HADLEY | 094510 |
| FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR EXTERNAL LEAKAGE AT THE TANK MOUNTING FLANGE AS RESULT OF TWO ATTACH BOLTS BEING FINGER TIGHT. LOW BOLT TORQUE ATTRIBUTED TO STRESS RELAXATION OF ALUMINUM THREADED MATERIAL AS RESULT OF ABNORMAL TESTS OF THE VEHICLE AND/OR IMPROPERLY TORQUED BOLTS AT ORIGINAL INSTALLATION. LEAKAGE WAS ALSO FOUND AT THE FLANGED JOINT BETWEEN THE PREVALVE AND THE STAGING VALVE, DUE TO LOW TORQUE ON THE ATTACH BOLTS, AS REPORTED ON PAR 9D-08-224P. | | | | | | | |
| CORRECTIVE ACTION-SITE PERSONNEL RETORQUED ALL BOLTS TO PROPER VALUE. APPROPRIATE PERSONNEL REQUESTED TO EXERCISE GREATER CARE IN TORQUING THE ATTACH BOLTS DURING VALVE INSTALLATION. | | | | | | | |

PROPRIETARY

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| PROPULSION INTERFACE-A/B FUEL FEED | SP-90-06-225F MOSE ASSEMBLY, BOOSTER IGNITER-B IN TORQUING B-NUTS | FAR 27-02189-3 | 1190 6'0487 | 1-2/PALC YES 60/C NO | | |
| FAILURE MODE-LEAK-EXTERNAL. FUEL WAS FOUND LEAKING AT THE B-NUT CONNECTING THE MOSE TO THE BOOT STRAP CHECK VALVE. TORQUE ON THE B-NUT WAS FOUND TO BE LOW AND ATTRIBUTABLE TO STRESS RELAXATION DURING TRANSPORTATION AND THE ABNORMAL TESTS TO WHICH THE VEHICLE WAS SUBJECTED, OR APPLICATION OF IMPROPER TORQUE AT INSTALLATION. | | | | | | |
| CORRECTIVE ACTION-SITE PERSONNEL RETORQUED B-NUT TO PROPER VALUE AND LEAK STOPPED. APPROPRIATE FACTORY PERSONNEL REQUESTED TO EXERCISE GREATER CARE IN TORQUING B-NUTS. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | SP-90-06-225F BOOSTER GAS GENERATOR LINE, B-NUT 27-22433-3 | FAR 27-22433-3 | 1190 03'428 | 1-2/PALC YES 60/C NO | | |
| FAILURE MODE-LEAK-EXTERNAL. INDICATIONS OF FUEL LEAK FOUND AT START LINE B-NUT DUE TO LOW TORQUE, ATTRIBUTED TO EFFECTS OF TRANSPORTATION, ABNORMAL VEHICLE TESTS, AND/OR IMPROPER TORQUE APPLICATION AT INSTALLATION. | | | | | | |
| CORRECTIVE ACTION-SITE PERSONNEL RETORQUED B-NUT AND LEAK STOPPED. FACTORY PERSONNEL REQUESTED TO EXERCISE GREATER CARE IN TORQUING B-NUTS. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | SP-90-06-225F IGNITER VALVE MOSE, B-NUT | FAR 27-02375-5 | 1190 03'0412 | 1-2/PALC YES 60/C NO | | |
| FAILURE MODE-LEAK-EXTERNAL. B-NUT FUEL LEAK DISCOVERED DURING SYSTEM CHECK. LOW TORQUE ON B-NUT WAS CAUSE OF LEAK, ATTRIBUTED TO EFFECTS OF TRANSPORTATION, ABNORMAL VEHICLE TESTS AND/OR APPLICATION OF IMPROPER TORQUE DURING INSTALLATION. | | | | | | |
| CORRECTIVE ACTION-SITE PERSONNEL RETORQUED B-NUT AND LEAK STOPPED. FACTORY PERSONNEL REQUESTED TO EXERCISE GREATER CARE IN TORQUING B-NUTS DURING INSTALLATION. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-90-06-194F V/E TUBE, RIGID | FAR 27-24007-7 | 01E 03'3501 | WTR YES 60/C NO | | |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR BEING CRACKED. TUBE CONTAINED A 1/2 INCH LONG CRACK IN A 90 DEGREE BEND, 6 INCHES FROM THE TUBE END. ANALYSIS INDICATED ELECTROLYTIC ACTION BETWEEN THE ALUMINUM FAILED TUBE AND A STAINLESS STEEL LINE IN COMBINATION WITH SALT AIR ATMOSPHERE. | | | | | | |
| CORRECTIVE ACTION-ALL VEHICLES UNDER 60/C CONTROL WERE INSPECTED FOR EVIDENCE OF THE ABOVE CONDITION. | | | | | | |

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| PROPULSION INTERFACE-A/B FUEL FEED | A-99-06-189F PRE-VALVE BELLOWS | FAR 27-02306-1 | 63126 | FACTORY | YES | CIRCLE WELD NO | 898484 |
| FAILURE MODE-LEAK EXTERNAL. THREE UNITS FAILED HYDROSTATIC TEST. FAILURE WAS RESULT OF CHLORIDE RESIDUES COMBINING WITH MOISTURE, FORMING AN ACID WHICH ATTACK THE BELLOWS MATERIAL TO THE POINT OF PENETRATION, CAUSING A LEAK. 30 BELLOWS AT VENDORS PLANT FOUND IN SIMILAR CONDITION. 1 OTHER CASE REPORTED ON FAR A-99-06-209F. | | | | | | | |
| CORRECTIVE ACTION-VENDOR REVISED HIS PROCEDURES TO BAKE THE BELLOWS, TO REMOVE MOISTURE, AND THEN SEAL IN PLASTIC CONTAINERS. ALL BASES WERE INSTRUCTED TO REPLACE ALL SUCH BELLOWS. RECEIVING INSPECTION BEGAN CHECKING ALL BELLOWS RECEIVED FOR PRESENCE OF CHLORIDE RESIDUE. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 3P-9D-06-183F PREVALVE, BOOSTER FUEL ACTUATOR | FAR 7-02287-15 | 227D 62 220 | WTR | YES | MADLEY NO | 898217 |
| FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR GAS LEAKAGE FROM THE ACTUATOR VALVE-OPEN PORT WITH PRESSURE APPLIED TO THE VALVE-CLOSED PORT. FAILURE CONFIRMED AND CAUSED BY INCORRECT ASSEMBLY OF THE ACTUATOR LOCKING MECHANISM. | | | | | | | |
| CORRECTIVE ACTION-VENDOR PERSONNEL ALERTED TO PROBLEM AND REQUESTED TO BE MORE DILIGENT. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-99-06-184F BOOSTERLINE-FLEX-BOSS | FAR 27-21109-607 | 62127 | FACTORY | YES | 60/C NO | 898239 |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR PARENT MATERIAL CRACKING ADJACENT TO A FUSION WELD JOINING A BOSS TO AN ELBOW. CRACKING WAS THE RESULT OF HIGH RESIDUAL STRESSES DUE TO COLD WORKING, PREFERENTIAL ETCHING DURING CLEANING, LACK OF PRE-HEAT AND POST-HEAT OF COMPONENTS AND LACK OF PROPER BACKUP AND HOLDING FIXTURES. | | | | | | | |
| CORRECTIVE ACTION-A RESEARCH PROGRAM DEVELOPED IMPROVED WELDING TECHNIQUES OVER THOSE OUTLINED ABOVE. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-9D-06-189F SUSTAINER PRE-VALVE | FAR 27-02290-1 | 64C 62119 | OSTP1/MT R | YES | STRATON NO | 898232 |
| FAILURE MODE-LEAK-UNIT REJECTED FOR INTERNAL LEAKAGE. | | | | | | | |
| CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED. | | | | | | | |

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| PROPULSION INTERFACE-A/B FUEL FEED | A-138-08-170 TUBE ASSEMBLY, V/E B-NUT | FAR 27-24007-7 AND-9 | 73F 621110 | SYC. | YES NO | YES 60/C |
| FAILURE MODE-STRUCTURAL-UNIT REJECTED FOR A CRACKED B-NUT. INVESTIGATION REVEALED STRESS-CORROSION CRACKING OF 2014 OR 2017 ALUMINUM ALLOY. 7 ADDITIONAL CASES REPORTED IN FAR 90-08-133F, -180, -196, -20, 81-2 10,- 216,-217. CT-68-0 8- 041F,-042F, -041C, -046C. | | | | | | |
| CORRECTIVE ACTION-ALL AFFECTED PERSONNEL CAUTIONED ON USE OF PROPER TOLUENE VALUES. MIL-P-5509A AMENDMENT 7, JAN. 18, 1963. RESTRICTS USE OF ALUMINUM ALLOYS FOR SUCH PARTS TO 8081 OR 2024, T-8 CONDITION OR BETTER. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-98-08-192F VALVE, RESIDUAL DRAIN | FAR | 621111 | PLAPB | YES NO | YES KOCHLER |
| FAILURE MODE-LEAK-EXTERNAL, UNIT WAS REJECTED FOR LEAKAGE. | | | | | | |
| CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-98-08-203C SUSTAINER DUCT | FAR 27-22230-801 | 18F 621107 | 11/ETR | YES NO | YES 60/C |
| FAILURE MODE-LEAK-EXTERNAL-UNIT REJECTED FOR LEAKAGE. NO FAILURE ANALYSIS PERFORMED DUE TO LACK OF FUNDING. | | | | | | |
| CORRECTIVE ACTION-NONE. NO FAILURE ANALYSIS PERFORMED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-90-06-191F SUSTAINERPREVALVE, SEAL | FAR 27-08230-1 | 64E 621026 | OSIFL/WT R | YES NO | YES STRATOS |
| FAILURE MODE-LEAK. UNIT REJECTED FOR INTERNAL LEAKAGE. FAILURE ANALYSIS NOT PERFORMED SINCE VALVE WAS RECEIVED WITH THE SEAL CALLED OUT OF ITS GROOVE, ATTRIBUTED TO HIGH FRICTION BETWEEN THE SEAL AND VALVE. THIS ATTRIBUTED TO FUEL WASHING THE LUBRICANT FROM THE SEAL. 1 ADDITIONAL CASE REPORTED ON FAR 9F-08-093. | | | | | | |
| CORRECTIVE ACTION-ECPI981, DATED JAN. 18, 1983, CHANGES THE BOND BETWEEN THE SEAL GROOVE AND SEAL AND COATS THE VALVE INNER WALLS WITH TEFLON. | | | | | | |

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| PROPULSION INTERFACE-A/B FUEL FEED | A-90-08-186 BOOSTER PREVALVE SEAL | FAR 27-21200-603 | 620807 | SAFE | YES NO | 60/C |
| FAILURE MODE-INTERNAL LEAKAGE, LEAKAGE CONFIRMED AND CAUSED BY A METAL CHIP ATTACHED TO THE SEALING EDGE OF THE BUTT JAW CLOSURE. 2 OTHER UNCONFIRMED REPORTS COVERED ON FAR-9M-08 -187, -187. | | | | | | |
| CORRECTIVE ACTION-ALL PROCESSES AND PROCEDURES FOR POSSIBLE IMPROVEMENT, AS RESULT A DRAWING CHANGE ADDED A REQUIREMENT TO APPLY TORQUE PAINT TO THE OPEN-CLOSE INDICATOR TO INDICATE ANY OPENING OF THE VALVE AFTER FUNCTIONAL TESTING | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-90-08-178F FILL AND DRAIN VALVE O-RING | FAR 7-02313-3 | 63F 620731 | DATE | YES NO | ATRESEARCH |
| FAILURE MODE-LEAK, UNIT REJECTED FOR INTERNAL LEAKAGE PAST THE BUTTERFLY SEAL. FAILURE CONFIRMED AND ATTRIBUTED TO A DAMAGED O RING PARTIALLY EXTRUDED FROM ITS GROOVE. | | | | | | |
| CORRECTIVE ACTION-VALVE SEAL ARRANGEMENT REDESIGNED UNDER ECP 1930-1, -2, -3, ECP 5187R1 AND ECP7112, VALVE IDENTIFIED AS P/N7-02313-601. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A6-98-06-159 LINE BELLWAS | FAR 27-22404-1 | 143D 620719 | ETR | YES NO | 60/C |
| FAILURE MODE-STRUCTURAL, UNIT REJECTED FOR EXTERNAL LEAKAGE, LEAKAGE CONFIRMED AND CAME FROM A WELD PIN HOLE, CAUSED BY WELD POROSITY. | | | | | | |
| CORRECTIVE ACTION-ASSEMBLY PLANNING AND INSPECTION PROCEDURES REVIEWED AND CONSIDERED SATISFACTORY. 100 PERCENT XRAY INSPECTION IS NOT WARRANTED IN VIEW OF COSTS AND RANDOM NATURE OF FAILURE. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-90-08-185 LINE ASSEMBLY, SEAL | FAR 27-22404-1 | 1240 620719 | WTR | YES NO | |
| FAILURE MODE-LEAK-EXTERNAL, UNIT REJECTED FOR AN EXTERNAL LEAK AT THE FLANGE, LEAKAGE CONFIRMED AND ATTRIBUTED TO A CRACKING DOWN OF THE TORQUE SEAL AT THE WELD JOINT. | | | | | | |
| CORRECTIVE ACTION-VENDOR INITIATED 100 PCT INSPECTION TO INSURE PROPER CROSS SECTION AT THE WELD. | | | | | | |

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| PROPULSION INTERFACE-A/B FUEL FEED | A-9C-20-144F RESIDUAL DRAIN VALVE | FAR | 620702 | LAFB | YES NO 3-9002 | YES KOEHLER NO 3-9002 |
| FAILURE MODE-LEAK-EXTERNAL, UNIT REJECTED FOR EXTERNAL LEAKAGE FROM THE SHAFT HANDLE. LEAKAGE WAS NOT CONFIRMED, IT COULD HAVE ORIGINATED IN SOME NEARBY COMPONENT. | | | | | | |
| CORRECTIVE ACTION-LAFB ADVISED OF ANALYSIS RESULTS AND OF POSSIBLE OTHER LEAK SOURCES. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-9B-08-181 BOOSTER STAGING VALVE FLANGE | FAR 27-21130-3 | 620820 | ETR | YES NO | |
| FAILURE MODE-STRUCTURAL, UNIT REJECTED FOR AN INTERNAL LEAK AT THE FLANGE WELD. LEAKAGE CONFIRMED AND ATTRIBUTED TO A CRACK IN THE DISCONNECT FLANGE WELD. THE CRACK DEVELOPED IN TRANSVERSE GRAIN STRUCTURE OF THE MATERIAL, PROBABLY CAUSED DURING WELDING. MATERIAL WAS AISI321 STAINLESS PLATE STOCK. | | | | | | |
| CORRECTIVE ACTION-DRAWING CHANGE DELETED COLD ROLLED PLATE STOCK AS AN ALTERNATE MATERIAL. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-9D-08-151 BOOSTER PRE-VALVE | FAR 27-21200-003 | 620616 | LAFB | YES NO | |
| FAILURE MODE-LEAK-UNIT REJECTED FOR INTERNAL LEAKAGE. | | | | | | |
| CORRECTIVE ACTION-LEAK CHECK PROCEDURE REVISED TO ELIMINATE POSSIBILITY OF REJECTING ACCEPTABLE VALVES. FAILURE NOT CONFIRMED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-9D-08-156 V/E HOSE BELLOWS | FAR 27-02403-603 | 19F 620612 | WTR | YES NO | YES COMBIC NO |
| FAILURE MODE-LEAK-EXTERNAL, UNIT REJECTED FOR EXTERNAL LEAKAGE AT ONE OF THE BELLOWS. | | | | | | |
| CORRECTIVE ACTION-FAILURE NOT CONFIRMED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-9D-08-145 VERNIER CHECK VALVE WEHNUT | FAR 27-02402-3 | 57F 620330 | WTR | YES NO | YES PARKER NO |
| FAILURE MODE-LEAK-EXTERNAL, UNIT REJECTED FOR EXTERNAL LEAKAGE FROM THE VALVE BODY-HEX NUT INTERFACE. LEAKAGE CONFIRMED AND ATTRIBUTED TO OVERTORQUING AT ASSEMBLY AND GALLING IN THE AFFECTED AREA. | | | | | | |

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| CORRECTIVE ACTION-VENDOR REDESIGNED THE VALVE TO INCLUDE A TEFLON SEAL IN THE AFFECTED AREA. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-90-06-133 BOOSTER PRE-VALVE | FAR 27-21200-803 | 13F 620316 | WTR | YES NO | |
| FAILURE MODE-LEAK-UNIT REJECTED FOR INTERNAL LEAKAGE. LEAKAGE CONFIRMED AND CAUSED BY A METAL CHIP ATTACHED TO THE SEALING EDGE OF THE BUTTERFLY CLOSURE. NO LEAKAGE EVIDENT UPON REMOVAL OF CHIP. | | | | | | |
| CORRECTIVE ACTION-SPECIFICATIONS AND PROCEDURES REGARDING CLEANLINESS REVIEWED, RESULTING IN RELOCATING THE PREVALVE ASSEMBLY AREA TO ONE HAVING A GREATER DEGREE OF CLEANLINESS. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | HG-9B-06-129 PREVALVE, SUBSTAINER | FAR 7-02281-19 | 107D 620424 | ETR | YES B.M. HADLEY NO | |
| FAILURE MODE-FAIL DURING OPERATION, UNIT REJECTED FOR FAILURE TO CLOSE. IN FAILURE ANALYSIS. | | | | | | |
| CORRECTIVE ACTION-FAILURE NOT CONFIRMED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-9F-06-119 SUBSTAINER PREVALVE O RING | FAR 7-02281-19 | 58D 620313 | WAFB | YES R.H. HADLEY NO | |
| FAILURE MODE-EXTERNAL LEAK. UNIT WAS REJECTED FOR FAILURE TO CLOSE. FAILURE CAUSED BY EXTERNAL LEAKAGE IN THE UNLOCKING PRESSURE SYSTEM DUE TO A SHREDDED O RING. FAILURE CONCLUDED TO BE THE RESULT OF AN UNKNOWN NUMBER OF VALVING CYCLING. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |
| PROPULSION INTERFACE-A/D FUEL FEED | A-90-06-116 FUEL PREVALVE BELLOW | FAR 27-21200-8 | 7F 620307 | ETR | YES CONVAIR NO | |
| FAILURE MODE-EXTERNAL LEAK-UNIT REJECTED FOR EXTERNAL LEAKAGE FROM RELEASE ASSEMBLY BELLOW. LEAKAGE WAS COMING FROM A PIN HOLE IN BELLOW. CAUSE CORROSION, AS RESULT OF RESIDUAL SOLDERING FLUX IN THE AREA OF THE SOLDER JOINT. | | | | | | |
| CORRECTIVE ACTION-NPS REVISED TO PROVIDE SPECIFIC SOLDERING PROCEDURES AND FLUX REMOVAL. | | | | | | |

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| PROPULSION INTERFACE-A/B FUEL FEED | A-98-06-117 CHECK VALVE SEAL, FUEL START TANK VENT | FAR 7-02237-1 | 109D 620308 | ETR | YES NO | CIRCLE SEAL | 099467 |
| FAILURE MODE-INTERNAL LEAK- UNIT REJECTED FOR FAILURE TO SEAT AND INTERNAL LEAKAGE. THE VALVE HAD BEEN DISASSEMBLED IN THE FIELD AND HAD REPORTED A TORN AND DISTORTED O RING. UPON DISASSEMBLY AT S.D. THE O RING WAS SATISFACTORY BUT NOT IN ITS CORRECT POSITION, WHEN PROPERLY LOCATED THE VALVE FUNCTIONED TO SPEC. REQUIREMENTS. THE EXACT CAUSE OF THE LEAKAGE NOT DETERMINED. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | HC-98-06-115 SUSTAINER FUEL PREVALVE | FAR 7-02281-15 | 109D 620305 | ETR | NO YES | B.H. MADLEY | 099467 |
| FAILURE MODE-INTERNAL LEAK. UNIT REJECTED FOR SUSPECTED INTERNAL LEAKAGE. FAILURE COULD NOT BE CONFIRMED. SUBSEQUENT INFORMATION REVEALED FUEL LEAKAGE ORIGINATED IN A CHECK VALVE IN THE FUEL START SYSTEM. | | | | | | | |
| CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-98-06-114 PREVALVE RIVET | FAR 27-21200-3 | 247 620223 | SAFB | YES NO | CONVAIR | 099469 |
| FAILURE MODE-STRUCTURAL. UNIT REJECTED FOR FAILURE TO RESET DURING MISSILE CHECKOUT. FAILURE TO RESET DUE TO BUTTER FLY BEING FREE TO ROTATE ON ITS SHAFT AS RESULT OF SHEARING OF THE LOCKING RIVET. SHEARING OF RIVET ATTRIBUTED TO EXCESSIVE TORQUE WHEN RESETTING VALVE. | | | | | | | |
| CORRECTIVE ACTION-FIELD PERSONNEL WERE CAUTIONED TO REFRAIN FROM ACTUATING VALVE. RIVET DIAMETER INCREASED IN -803 VALVE. CHANGE RELEASED IN DEC. 1961. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | ABD-06-109 VERNIER FUEL CHECK VALVE ORIFICE B NUT | FAR 27-02402-3 | 840214 | ETR | YES NO | PARKER | 099374 |
| FAILURE MODE-EXTERNAL LEAK-UNIT REMOVED FOR LEAKAGE FROM A CRACKED HEX NUT. FAILURE CONCLUDED TO BE THE RESULT OF OVERTORQUING DURING ASSEMBLY BY VENDOR. | | | | | | | |
| CORRECTIVE ACTION-VENDOR REINSTRUCTED PERSONNEL REGARDING PROPER TORQUE VALUES TO BE MAINTAINED. | | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REVIEW-PROULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO |
|--|--|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B FUEL FEED | A-98-08-109 VERNIER FUEL SUPPLY HOSE ASSEMBLY SEAL | FAR 27-02403-803 | 680131 | SYC. | NO YES | COSMIC |
| FAILURE MODE-EXTERNAL LEAK- UNIT REJECTED FOR FUEL SEEPAGE PAST THE FLANGE SEAL. FAILURE COULD NOT BE CONFIRMED DUE TO LACK OF MATING NAA PART- HOWEVER, SEAL GROOVE HAD PROPER DIMENSIONS. CONCLUDED THAT HOSE DID NOT FAIL- AND, THE MATING NAA PART CAUSED THE FAILURE DUE TO AN IMPROPER SEAL GROOVE. | | | | | | |
| CORRECTIVE ACTION-60/C REQUESTED ROCKETDYNE, BY TWR 508418, TO REDIMENSION AND REMAKE THEIR PART. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-98-08-108 VERNIER FUEL SUPPLY HOSE ASSEMBLY, SEAL | FAR 27-02403-801 | 680125 | 11/ETR | YES NO | COSMIC |
| FAILURE MODE-EXTERNAL LEAK-UNIT REJECTED FOR FUEL SEEPING PAST THE FLANGE SEAL. REPLACEMENT HOSE LEAKED IN A SIMILAR MANNER. FAILURE NOT CONFIRMED DUE TO LACK OF MATING PART (NAA). FAILURE CONCLUDED TO BE CAUSED BY AN IMPROPER TORQUE SEAL GROOVE, AS IN PRIOR CASES HOSE WAS REPLACED WITH A -803. | | | | | | |
| CORRECTIVE ACTION-ECF 1682 REPLACED SUBJECT HOSE WITH A -803 HAVING A PROPER TORO SEAL GROOVE. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-98-08-110 SUSTAINER MANUAL PREVALVE SEAL | FAR 27-02250-1 | 38E 620119 | ETR | YES NO | STRATOS |
| FAILURE MODE- INTERNAL LEAK. UNIT WAS REJECTED FOR LEAKAGE. EXAMINATION REVEALED MAIN SEAL WAS SPLIT INTO FOUR PIECES, TWO PIECES WEDGED BETWEEN THE BUTTERFLY AND HOUSING, AND 1 PIECE IN THE SEAL GROOVE. TEST INDICATED SEAL COULD BE DISPLACED FROM GROOVE BY PRESSURIZING SYS. DOWNSTREAM OF VALVE- SUCH AS RECEIVING FUEL START TANK PRESS. TO THE MAIN FUEL TANK, WITH VALVE CLOSED INITIALLY. UPON OPENING VALVE AERODYNAMIC FORCES DISPLACE SEAL. SUBSEQUENT VALVE CLOSING CUTS THE SEAL. | | | | | | |
| CORRECTIVE ACTION-ECF 1981 COVERED REDESIGN OF VALVE TO PROVIDE MORE SPACE FOR SEAL EXPANSION WITHIN THE SEAL FLANGE, AND BY LUBRICATING THE VALVE BODY WITH TEFLON. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-98-08-108 PRE-VALVE, SUSTAINER FUEL | FAR 27-81800-5 | 3F 020111 | ETR | YES NO | CONVAIR |
| FAILURE MODE-LEAK-EXTERNAL-UNIT WAS REMOVED FOR FUEL LEAKAGE FROM THE RELEASE ASSEMBLY BELLONAS. LEAKAGE CONFIRMED A HO WAS COMING FROM A PIN HOLE ADJACENT TO A SOLDER JOINT IN THE BELLONAS ASSEMBLY. THIS WAS THE RESULT OF CORROSION CAUSED BY COMPLETE REMOVAL OF ACID FLUX. | | | | | | |
| CORRECTIVE ACTION-NPS REVISED 18-1-61 TO INCLUDE MORE DETAILED INSTRUCTIONS FOR SOLDERING AND FLUX REMOVAL. | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REVIEW-PROLUSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO |
|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B FUEL FEED | GR-08-083 PREVALVE, FUEL, SUSTAINER | FAR 7-02281-19 | 912702 | | YES NO | B.M. MADLEY |
| FAILURE MODE-LEAK-LEAKAGE PAST BUTTERFLY SEAL. FAILURE NOT CONFIRMED. | | | | | | |
| CORRECTIVE ACTION-NONE | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | GR-08-083 PREVALVE, FUEL, BOOSTER | FAR 7-02287-19 | 912702 | | YES NO | B.M. MADLEY |
| FAILURE MODE-FAIL DURING OPERATING-VALVE REPORTED TO HAVE BOUND-UP DURING ACTUATION. | | | | | | |
| CORRECTIVE ACTION-FAILURE NOT CONFIRMED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-9H-06-100 PRE-VALVE, SUSTAINER FUEL, SEAL | FAR 27-02230-1 | 33E 611219 | FAPB | YES NO | STRATON |
| FAILURE MODE-LEAK-UNIT REMOVED FOR SEVERE INTERNAL LEAKAGE DURING CHECKOUT OF MISSILE. A 100 DEGREE SEGMENT OF THE BUTTERFLY SEAL HAD BEEN TORN AWAY. | | | | | | |
| CORRECTIVE ACTION-ECF 1981 COVERED REDESIGN OF THE VALVE SEAL ARRANGEMENT AND WAS RELEASED 2-11-83. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | A-9F-06-096 PRE-VALVE, SUSTAINER FUEL | FAR 27-02230-1 | 34E 611116 | WAPB | YES NO | STRATON |
| FAILURE MODE-LEAK- UNIT REMOVED FOR INTERNAL LEAKAGE WHICH COULD NOT BE CONFIRMED DURING FAILURE ANALYSIS. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 98-08-084 VALVE, FUEL STAGING | FAR 27-02207 | 26E 611109 | ETR | YES NO | FLIGHT REFUEL |
| FAILURE MODE-LEAK-EXTERNAL-UNIT REMOVED FOR EXTERNAL LEAKAGE DURING A FUEL TANKING OPERATION. LEAKAGE COULD NOT BE CONFIRMED DURING FAILURE ANALYSIS. | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO | |
|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-NONE. | | | | | | | 000367 |
| PROPULSION INTERFACE-A/B FUEL FEED | 99-06-088 HOSE ASSEMBLY-SUSTAINER FUEL START 27-02183-3 | FAR | 61102 | SD | YES | STRATOFLEX | 000269 |
| FAILURE MODE-LEAK-EXTERNAL-HOSE REJECTED FOR EXTERNAL LEAKAGE AT THE END FITTING B NUT, DUE TO GALLING. EXAMINATION REVEALED SEVERE GALLING BETWEEN THE NUT AND HOSE END FITTING. FAILURE ATTRIBUTED TO SIMILAR HARDNESS OF MATERIAL OF THE TWO SURF CES. LACK OF LUBRICATION DUE TO CLEANING FOR FUEL SERVICE. | | | | | | | |
| CORRECTIVE ACTION-NONE-CONSIDERED A MINOR PROBLEM AND CONFINED ONLY TO D VEHICLES. | | | | | | | 000496 |
| PROPULSION INTERFACE-A/B FUEL FEED | 88-06-088 PRE-VALVE, FUEL SUSTAINER | FAR 27-21200-3 | 5L 611016 | SYC. | YES | CONVAIR | |
| FAILURE MODE-LEAK-EXTERNAL-VALVE REJECTED DUE TO EXTERNAL LEAKAGE AT THE BELLOW. EXAMINATION REVEALED A PIN HOLE A DJACENT TO A SOLDER JOINT, AND WAS CAUSED BY CORROSION RESULTING FROM CHEMICAL ACTION OF RESIDUAL ACID FLUX. | | | | | | | |
| CORRECTIVE ACTION-ECR 1637 SUBMITTED FOR VALVE REDESIGN. MPS REVISED CORRECTING METHODS OF FLUX REMOVAL. | | | | | | | 000277 |
| PROPULSION INTERFACE-A/B FUEL FEED | 98-06-084 PREVALVE FUEL RELEASE ASSEMBLY, SU 27-21241-3 STATNER | F/R | 611003 | ETR | YES | CONVAIR | |
| FAILURE MODE-STRUCTURAL-THE ASSEMBLY FAILED WHEN THE BELLOW PROTECTIVE HOUSING PULLED LOOSE FROM THE UNIT AS THE R UNIT FORCE WAS APPLIED. THIS WAS DUE TO THE RELEASE OF THE EXTERNAL SNAP RING WHICH RETAINS THE HOUSING TO THE RELEA SE PIN SHAFT. EXAMINATION SHOWED THE SNAP RING GROOVE WIDTH AND BOTTOM RADIUS WERE NOT TO SNAP RING MANUFACTURES REC CIRCIFICATIONS. THE CHAMFERED HOLE, IN THE BELLOW HOUSING AT THE CONTACT AREA WITH THE SNAP RING WAS ALSO NOT TO THE VENDOR'S RECOMMENDATION. | | | | | | | |
| CORRECTIVE ACTION-A CLO-E FITTING WASHER WAS ADDED BETWEEN THE SNAP RING AND THE BELLOW HOUSING. THIS ASSEMBLY IS A 3. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | AC-61-0096/82-504-A3-01 BUTTERFLY TYPE FUEL PREVALVES | CAPTIVE 27-21200 | 5E 310919 | 52/3YC | YES | 60/C | |
| FAILURE MODE-OUT OF TOLERANCE- THE B1, B2 AND 3 PREVALVES DID NOT OPEN WITHIN THE TOLERANCE PRESSURE OF 30 PLUS MIN US 0 PSIG. OPENING PRESSURES WERE 51, 27 AND 50 PSIG FOR THE B1, B2 AND SUSTAINER PREVALVES RESPECTIVELY. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |

15 JUN 1966

GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REVIEW-PROPUSSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIT DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO | |
|---|---|--------------------------------|---------------------|------------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-NONE. | | | | | | | 999344 |
| PROPULSION INTERFACE-A/B FUEL FEED | 9A-08-081 STAGING VALVE BELLOW- BOOSTER | FAR 87-21136-3 | SCD 810824 | EAFB | YES NO | | 999889 |
| FAILURE MODE-LEAKAGE. UNIT REPLACED WHEN EXTERNAL LEAKAGE WAS NOTED FROM THE BELLOW'S SECTION FOLLOWING A TANKING TEST. PRIOR TO FAILURE THE UNIT HAD UNDERGONE 71 PRESSURE CYCLES, 36 HIGH FLOW RATE AND 5 LOW FLOW RATE TANKING TEST. VISUAL EXAMINATIONS REVEALED A ONE INCH CRACK IN THE SEVENTH CONVOLUTION BELOW THE STAGING SEAL. FAILURE WAS ATTRIBUTED TO METAL FATIGUE OF BELLOW'S. | | | | | | | |
| CORRECTIVE ACTION-NONE-UNIT PERFORMED IN EXCESS OF INTENDED LIFE CYCLE. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | AB-41-0017/14-011-LS SUSTAINER FUEL PREVALVE BUTTERFLY | CAPTIVE | 1-4F 810822 | EDWARDS 7-595.20 N) | YES | | 999367 |
| FAILURE MODE-FAIL TO OPEN AT PRESCRIBED TIME. SUSTAINER FUEL PREVALVE STARTED TO OPEN AT 49.0 PSIG. SPECIFIED OPENING PRESSURE IS 38 PLUS MINUS 8 PSIG. | | | | | | | |
| SYSTEM EFFECT-OPERATION STARTS LATE. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-SUSTAINER FUEL PREVALVE WAS INS BY INSPECTION. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 9A-08-08-080 PRE VALVE, FUEL BOOSTER | FAR 7-08287-15 | 810810 | WTR | YES NO | YES O.M. HADLEY | 999874 |
| FAILURE MODE-LEAKAGE. VALVE REMOVED DURING LEAK CHECK FOR INTERNAL LEAKAGE. LARGE AMOUNT OF CONTAMINATION AT THE WELDER RINGS AND SEAL. THE SEAL CONTAINED A GOUGE BEHIND THE SEAL LIP ALLOWING FLOW OF FLUID PAST SEAL LIP. | | | | | | | |
| CORRECTIVE ACTION-VENDOR NOTIFIED OF QC PROBLEM AND REQUESTED TO IMPROVE HIS QC. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 9K-08-077 ADAPTER, A/B, FUEL FILL AND DRAIN | FAR 87-02198-3 | 810808 | FAPB | YES NO | YES SOLAR AIRCRAFT CO. | |
| FAILURE MODE-LEAK-EXTERNAL-UNIT LEAKING FUEL FROM THE AREA OF THE RESISTANCE WELD LIP JOINT BETWEEN THE BODY AND ATTACHMENT FLANGE. INVESTIGATION REVEALED ONE INCH ARC LEAKAGE. THIS WAS A WELD DISCONTINUITY CAUSED BY INSUFFICIENT FUSION DUE TO FAULTY WELDING PROCEDURE OR INADEQUATE CLEANING PRIOR TO WELDING. UNIT HAD EXPERIENCED FOUR FILL AND DRAIN OPERATIONS. | | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REV. EV-PROPULSION INTERFACE SYSTEM-AIRBORNE

| S/SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO |
|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-VENDOR REINSTRUCTED PERSONNEL AS TO THE REQUIREMENTS OF MIL-W-8938B. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 9F-06-078 VALVE, ORIFICE CHECK VERNIER FUEL | FAR 27-02402-8 | 610808 | WAFB | YES NO | PARKER AIRCRAF T |
| FAILURE MODE-LEAK-EXTERNAL-VALVE WAS REPLACED BECAUSE OF LEAKAGE DURING AN AF DEMONSTRATION OF THE M3 LEAK CHECK P ER PROCEDURE. FAILURE WAS NOT CONFIRMED. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | AB-61-0014/14-610-14 SUSTAINER FUEL PRE-VALVE BUTTERFLY | CAPTIVE | 1-4F 610601 | EDWARDS 7-313 | YES NO | |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME, SUSTAINER FUEL PREVALVE BEGAN OPENING AT STATIC PRESSURE, ABOVE THE MAXIMUM ALLOWABLE LIMIT OF 48 PSIG. SPECIFICATIONS CALL FOR 36 PLUS MINUS 8 PSIG. | | | | | | |
| SYSTEM EFFECT-OPERATION STARTS LATE. | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | |
| CORRECTIVE ACTION-VALVE WAS REJECTED BY INSPECTION (IN). | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | AD-61-0014/14-610-14 B2 FUEL PREVALVE BUTTERFLY | CAPTIVE | 1-4F 610601 | EDWARDS 7-316 | YES NO | |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME, B2 FUEL PREVALVE OPENED AT 47.2 PSIG RATHER THAN AT ITS SPECIFIED OPENING PRESSURE OF 36 PLUS MINUS 8 PSIG. | | | | | | |
| SYSTEM EFFECT-OPERATION STARTS LATE. | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | |
| CORRECTIVE ACTION-VALVE WAS REJECTED BY INSPECTION (IN). | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 9C-06-068 VALVE, CHECK SEAL, FUEL START TANK | FAR 7-02337-1 | 690 610512 | QAFB | YES NO | CIRCLE SEAL |
| FAILURE MODE-INTERNAL LEAK- VALVE FAILED TO SEAT, ALLOWING INTERNAL LEAKAGE. O RING SEAL HAD BEEN DISPLACED. REPOS ITIONING THE O RING CORRECTLY PROVIDED OPERATION WITHOUT LEAKAGE. REASON FOR O RING DISPLACEMENT COULD NOT BE DETERM INED. | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REVIEW-PROPOSITION INTERFACE SYSTEM-ANALYSTS

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTM | VENDOR NAME VENDOR PART NO |
|---|---|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-NONE. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 9F-08-037 A/B F AND D VALVE SEAL | FAR 7-02315-3 | 610301 | SYC/MWFB | YES | AIRRESEARCH NO |
| FAILURE MODE-CONTAMINATION- THIS REPORT COVERS FOUR VALVES, TWO FROM EACH BASE. ALL WERE REPORTED TO HAVE DAMAGED B UTTERFLY O RINGS. EXAMINATION REVEALED THE O RINGS HAD BEEN EXPOSED TO TRICHLOROETHYLENE WITH WHICH THE O RING MATERI AL (BUNA N) IS NOT COMPATIBLE. | | | | | | |
| CORRECTIVE ACTION-ECP SUBMITTED AND APPROVED TO DELETE THE TRIC PURGE OF THE FILL AND DRAIN SYSTEM ON GOLDEN RAN. I F SUCCESSFUL THE DELETION WILL BE ADOPTED AT ALL SITES. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 9F-08-043 BOOSTERFUELFE-VALVE,ACTUATOR | FAR 7-02287-15 | 330 610301 | MWFB | YES | B.H.MADLEY NO |
| FAILURE MODE-FAIL DURING OPERATION-DURING HIGH RATE FUEL FILL THE VALVE SLAMMED SHUT. THE ACTUATOR LOCKING MECHANIS M WAS FOUND BADLY WORN. THE ACTUATING CAM WAS BRIMELLED BY THE LOCKING BALLS. THIS VALVE HAD BEEN USED BEYOND ITS NO RMAL LIFE EXPECTANCY ON 330. WHICH HAD BEEN USED FOR PAD COMPATIBILITY CHECKS INCLUDING NUMEROUS TANKINGS AND DETACH INGS. | | | | | | |
| CORRECTIVE ACTION-NONE- FAILURE OCCURRED BEYOND THE NORMAL OPERATING LIFE OF THE VALVE. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 9F-08-037 FILL AND DRAIN VALVE O RING | FAR 7-02315-3 | 610301 | SYC. | YES | AIRRESEARCH NO |
| FAILURE MODE-CONTAMINATION - REPORT COVERS FOUR VALVES, TWO FROM EACH BASE. ALL WERE REPORTED TO HAVE DAMAGED BUTTE RFLY O RINGS. EXAMINATION REVEALED O RINGS HAD BEEN CONTAMINATED WITH TRICHLOROETHYLENE. THE O RING MATERIAL (BUNA N) IS NOT COMPATIBLE WITH TRICHLOROETHYLENE. OTHER BASE WAS MWFB. | | | | | | |
| CORRECTIVE ACTION-ECP SUBMITTED AND APPROVED TO DELETE THE TRICH. PURGE OF THE FILL AND DRAIN SYSTEM ON GOLDEN RAN. I F SUCCESSFUL, DELETION WILL BE ADOPTED AT ALL SITES. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 9B-00-817 VERNIER START TANK CHECK VALVE ORB 27-02408-3 PICE. | FAR ORB 27-02408-3 | 92 610209 | ETR | YES | PARKER NO |
| FAILURE MODE-OUT OF TOLERANCE. UNIT REJECTED FOR NO APPARENT ORIFICE. NO ORIFICE WAS FOUND IN THE VALVE FLAPPER. | | | | | | |
| CORRECTIVE ACTION-VENDOR NOTIFIED OF PROBLEM. ALL SUCH VALVES IN STOCK AND THOSE RECEIVED IN THE FUTURE WILL BE LEA | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REVIEW-PROPOSITION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO |
|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|
| R CHECKED TO DETERMINE IF ORIFICE IS PRESENT. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 90-06-068 PRE-VALVE, FUEL BOOSTER | FAR 7-02207-15 | 700 610203 | ETR | YES NO | B.H. MADLEY |
| FAILURE MODE-FAILED DURING OPERATION-UNITS REPORTED TO EXHIBIT INTERMITTENT ABILITY TO CLOSE. TESTING FAILED TO CONFIRM PROBLEM. REPORTED PROBLEM COULD ONLY BE DUPLICATED WHEN ACTUATING PRESSURE LINE WAS RESTRICTED TO REDUCE PRESSURE BUILD-UP RATE TO LESS THAN 240 PSI PER SECOND. CAUSE OF PROBLEM UNKNOWN SINCE A PURGE BOX CHECK AT WTR SHOWED NO DISCREPANCY AND REPLACEMENT VALVES OPERATED PROPERLY. | | | | | | |
| CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 90-06-068 BOOSTER FUEL PREVALVE. | FAR 7-02207-15 | 740 610203 | WTR | YES NO | B.H. MADLEY |
| FAILURE MODE-FAIL DURING OPERATION-UNIT EXHIBITS INTERMITTENT ABILITY TO CLOSE. PROBLEM COULD ONLY BE DUPLICATED WHEN ACTUATING PRESSURE LINE WAS RESTRICTED TO REDUCE PRESSURE BUILDUP RATE TO LESS THAN 240 PSI/SECOND. CAUSE UNKNOWN SINCE PURGE BOX CHECK AT WTR SHOWED NO DISCREPANCY, AND REPLACEMENT VALVES OPERATED PROPERLY. | | | | | | |
| CORRECTIVE ACTION-FAILURE NOT CONFIRMED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 9A-06-059 BOOSTER SECTION OF STAGING VALVE | FAR 27-21156 | 240 610105 | EAFB | YES NO | |
| FAILURE MODE-STRUCTURAL- A CRACK DEVELOPED IN ONE OF THE BELLOWS CONVOLUTIONS AFTER FORTY ONE TANKING- DETANKING OPERATIONS, AND THE REMOVAL OF THE PART THREE TIMES FOR O RING REPLACEMENT. THE UNIT WAS ALSO SUBJECTED TO SEVERE COCKING DUE TO ABNORMAL FORCES WHILE THE MISSILE TANK WAS VENTED DURING WELDING OPERATIONS WITH THE FUEL DUCT STILL PRESSURIZED TO SEQUENCE ONE. | | | | | | |
| CORRECTIVE ACTION-NONE- FAILURE WAS RESULT OF UNIQUE ENVIRONMENTS EXPERIENCED IN THE PARTICULAR OPERATIONS INVOLVED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 98-06-060 PREVALVE, BOOSTER FUEL | FAR 7-02207 | 610105 | OFFUTT | YES NO | B.H. MADLEY |
| FAILURE MODE-OUT OF TOLERANCE. VALVE REPORTED FOR INABILITY TO CLOSE UNDER PRESSURE. THE ACTUATOR CLOSE PORT ORIFICE PLUG WAS NOT COMPLETELY BEATED, RESULTING IN BLOCKAGE OF THE CLOSE PASSAGE TO THE ACTUATOR. THE PORT THREADS WERE NOT MACHINED TO THE REQUIRED DEPTH TO ALLOW THE ORIFICE PLUG TO CLEAR THE LOCKED GAS PASSAGE, ALLOWING THE ACTUATOR PORTION TO JAM ON THE LOCK MECHANISM BEFORE SUFFICIENT UNLOCKING PRESSURE COULD BE APPLIED. | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

19 JUN 1966

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO | |
|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-VENDOR AGREED TO REMOKE ALL VALVES HAVING THIS DISCREPANCY. THIS WAS ACCOMPLISHED IN FEB. 1965. | | | | | | | 999892 |
| PROPULSION INTERFACE-A/B FUEL FEED | 98-08-038 VALVE CHECK, VERNIER FUEL PURGE | FAR 27-02111-1 | 602001 | ETR | YES | SOUTHWESTERN V NO A. CORP | 999821 |
| FAILURE MODE-INTERNAL LEAK. SEVEN VALVES REPORTED FOR INTERNAL LEAKAGE DUE TO INTERFERENCE BETWEEN POPPET SEAL META INNER SCREW AND THE VALVE SEAT. | | | | | | | |
| CORRECTIVE ACTION- THE VENDOR HAS REDESIGNED THE VALVE TO PREVENT RECURRENCE OF THE ABOVE PROBLEM ALL VALVES MANUFA CTURED AFTER 10-1 SO INCORPORATED THIS CHANGE. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | AC-80-0045/31-508-AA-03 B1 LOW PRESSURE FUEL DUCT | CAPTIVE 27-21105-803 | 9C 601026 | BYC | YES NO | | 990943 |
| FAILURE MODE-STRUCTURAL. TURBO PUMP VIBRATION RESULTED IN A WELD FAILURE ON THE B1 LOW PRESSURE FUEL DUCT, ALLOWING FUEL TO RUN ON TO THE GAS GENERATOR EXHAUST DUCT. | | | | | | | |
| SYSTEM EFFECT-NONE. NO FIRE OR DAMAGE RESULTED FROM THE FUEL LEAK. | | | | | | | |
| VEHICLE EFFECT-NONE. THIS CONDITION WAS DISCOVERED ON POST TEST INSPECTION. | | | | | | | |
| CORRECTIVE ACTION-THE STRAIGHT LINE RIGID TUBE CONNECTED FROM BOSS TO TRANSDUCER WILL BE REPLACED WITH A LINE WITH BUILT-IN LOOP, TO REDUCE THE STRAIN AT THE BOSS. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | ETR-022/14-521-62-5C FUEL FILL AND RAIN VALVE, WIRING | CAPTIVE | 600929 | 1-4/EDNA RDS | YES NO | | 991402 |
| FAILURE MODE-FAIL DURING OPERATION. THE WIRES TO PINS B AND C WERE FOUND TO BE BARE. CONTACT BETWEEN THESE TWO PINS COULD HAVE CAUSED THE FILL AND DRAIN VALVE TO CYCLE PARTIALLY OPEN DURING THE TEST WHICH CAUSED AN ABNORMAL DECREAS E IN FUEL LEVEL WHICH IN TURN COMMANDED THE PU VALVE TO THE CLOSED CONTROL POSITION. THE PU VALVE WAS THEN RETURNED TO THE NORMAL POSITION WITH THE BLOCKHOUSE OVERRIDE. | | | | | | | |
| SYSTEM EFFECT-ERRATIC OPERATION. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | | |

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DIFFICULTIES REVIEW-PROFUSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | FRI OTH | VENDOR NAME VENDOR PART NO |
|--|--|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B FUEL FEED | AC-80-0038/51-501-A1-03 FUEL FILL AND DRAIN VALVE | CAPTIVE 27-08313-S | 5E 600923 | SYC | YES NO | |
| <p>FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. DURING THE COUNTDOWN, THE AIRBORNE FUEL FILL AND DRAIN VALVE FAILED IN THE CLOSED POSITION DURING VALVE CYCLING.</p> <p>SYSTEM EFFECT-OPERATION STOPS PREMATURELY.</p> <p>VEHICLE EFFECT-COUNTDOWN ABORTED AND RE-SCHEDULED.</p> <p>CORRECTIVE ACTION-VALVE WAS REMOVED AND REPLACED.</p> | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 98-08-049 FUEL PRE-VALVE SWITCH, BCG/STER | FAR 7-08287-15 | 54D 600706 | ETR | YES NO | YES B.H.HADLEY |
| <p>FAILURE MODE-FAILURE TO OPERATE AT PRESCRIBED TIME- DURING MANGER CHECKOUT THE VALVE FAILED TO GIVE AN ELECTRICAL OPEN INDICATION. INVESTIGATION REVEALED THE POSITION SWITCH WAS IMPROPERLY ADJUSTED. TORQUE PAINT WAS INTACT INDICATING THE ADJUSTMENT WAS MADE BY THE VENDOR. THE VALVE PROPER ACTUATED NORMALLY BUT WITHOUT PROPER INDICATION.</p> <p>CORRECTIVE ACTION-THE ACCEPTANCE TEST PROCEDURE WAS REVISED TO REQUIRE TESTING FOR PROPER VALVE POSITION INDICATION</p> | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 98-08-049 QUICK DISCONNECT, RESIDUAL DRAIN | FAR 700-9D4 | 40D 600219 | ETR | YES NO | YES W1661NS |
| <p>FAILURE MODE-INTERNAL LEAK- REPORTED LEAKING PAST POPPET. LEAKAGE COULD NOT BE CONFIRMED DURING FAILURE ANALYSIS, WITH DUST CAPS INSTALLED. WHEN LEAK WAS REPORTED, DUST CAPS WERE NOT INSTALLED.</p> <p>CORRECTIVE ACTION-NONE.</p> | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 98-08-049 QUICK DISCONNECT VALVE, RESIDUAL DRAIN | FAR 700-9D4 | 29D 600219 | ETR | YES NO | YES W1661NS |
| <p>FAILURE MODE-INTERNAL LEAK- THREE VALVES REPORTED LEAKING PAST POPPET. LEAKAGE COULD NOT BE CONFIRMED DURING FAILURE ANALYSIS, WITH DUST CAPS INSTALLED. WHEN LEAKAGE WAS REPORTED, DUST CAPS WERE NOT INSTALLED.</p> <p>CORRECTIVE ACTION-NONE.</p> | | | | | | |

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DIFFICULTIES REVIEW-PROPUSSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO |
|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B FUEL FEED | 98-08-04, QUICK DISCONNECT - RESIDUAL DRAIN 700-304 | FAR | 600219 | ETR | YES | WT661NS NO 480 |
| FAILURE MODE-INTERNAL LEAK- REPORTED LEAKING PAST POPPET. LEAKAGE COULD NOT BE CONFIRMED DURING FAILURE ANALYSIS WT TH DUST CAPS INSTALLED. WHEN LEAK WAS REPORTED, DUST CAPS WERE NOT INSTALLED. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | AZC-27-121/P3-48M-01-31 FUEL FILL AND DRAIN VALVE | COMPOSITE-FRD/DPL | 510 600217 | 13/ETR | YES NO | |
| FAILURE MODE-LEAK EXTERNAL. DURING FUEL TANKING, A LEAK WAS FOUND AT THE LOWER FLANGE OF THE FUEL FILL AND DRAIN VA LVE. LEAK WAS DUE TO A MISSING GASKET. | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | |
| VEHICLE EFFECT NONE. | | | | | | |
| CORRECTIVE ACTION-THE GASKET WAS INSTALLED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | ETR-008/14-302-C1-3E VERNIER SOLO FUEL TANK FILL LINE | CAPTIVE 27-24505-11 | 600204 | 1-4/EDNA RDS | YES NO | |
| FAILURE MODE-LEAK, EXTERNAL. A LEAK WAS DISCOVERED IN THE FUEL FILL LINE TO THE VERNIER SOLO TANK. | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | |
| VEHICLE EFFECT-PREMIATURE PROPULSION CUTOFF. FUEL LEAKAGE INTO THE THRUST SECTION RESULTED IN A SMALL FLAMM FIRE. OS SERVER INITIATED CUTOFF DUE TO HIGH THRUST SECTION TEMPERATURES. NO DAMAGE WAS SUSTAINED. | | | | | | |
| CORRECTIVE ACTION-A UNION WAS REPLACED AND THE JOINT RETORQUED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | DAB3A1-4MO-02-19 FLOAT SWITCH | COMPOSITE-FRD/DPL | 190 993106 | 376-A-1 | NO NO | |
| FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. THE FLOAT SWITCH IN THE INERT FLUID FILL UNIT STUCK AND PREVENTE D A COMPLETE SIGNAL FROM BEING OBTAINED BY LAUNCH CONTROL. | | | | | | |
| SYSTEM EFFECT-FAILURE TO OBTAIN 1PP COMPLETE RESULTED IN CONTINUOUS LOS DOME PURGES. CONTINUOUS PURGES COULD DEPLET E THE GMD SUPPLY RESULTING IN AN UNSAFE CONDITION FOR PROPELLANT DRAIN. | | | | | | |
| VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED. | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | |

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| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP TIME | SITE DIP TIME | PRI OTH | VENDOR NAME VENDOR PART NO | |
|---|--|--------------------------------|--------------------------|------------------|------------|-------------------------------|--------|
| PROPULSION INTERFACE-A/B FUEL FEED | FTAB402/PS-4BN-01-43 FUEL PREVALVE-FORWARD FLANGE | COMPOSITE-FRD/DPL | 410 591220 | 13/ETR | YES NO | | 891840 |
| <p>FAILURE MODE-LEAK EXTERNAL. AFTER FUEL TANKING, A LEAK WAS DISCOVERED AT THE JOINT BETWEEN THE BOOSTER FUEL PREVALVE E FORWARD FLANGE AND THE TANK APEN SKIN.</p> <p>SYSTEM EFFECT-NONE.</p> <p>VEHICLE EFFECT-NONE.</p> <p>CORRECTIVE ACTION-ATTEMPTED TO SEAL THE EXTERNAL AREA WITH EC1295 COMPOUND. A RECHECK DURING FUEL TANKING ON 4 JAN 80 SHOWED THE JOINT TO BE STILL LEAKING. THE AREA WAS AGAIN SEALED WITH EC1295 AND THE DECISION WAS MADE TO TANK FUE L ON 8 DAY INSTEAD OF 8-1 DAY.</p> | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 90-06-043 CHECK VALVE. FUEL START TANK VENT | FAR 7-02337-1 | 80 591215 | WTR | YES NO | YES LANAGAN | 899886 |
| <p>FAILURE MODE-INTERNAL LEAK- LEAKAGE, IN CHECK DIRECTION, NOTED WHEN VALVE WAS BEING INSTALLED. IF ON SEAT FOUND TO BE GALLED AND CONTAMINATED.</p> <p>CORRECTIVE ACTION-THIS VENDORS VALVE IS NO LONGER USED BY CONVAIR. NEW VENDOR IS JAMES PONG CLARK WHOSE VALVE HAS A DIFFERENT CONFIGURATION.</p> | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 90-06-043 CHECK VALVE SEAL, FUEL START TANK VENT | FAR 7-02337-1 | 80 591215 | WTR | YES NO | YES LANAGAN | 899874 |
| <p>FAILURE MODE-INTERNAL LEAK- LEAKAGE IN CHECK DIRECTION NOTED WHEN VALVE WAS BEING INSTALLED. TEFLON SEAT FOUND TO B E GALLED AND CONTAMINATED.</p> <p>CORRECTIVE ACTION-THIS VENDORS VALVE IS NO LONGER USED BY CONVAIR. NEW VENDOR IS JAMES PONG CLARK WHOSE VALVE HAS A DIFFERENT CONFIGURATION.</p> | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | FTAB450/PS-4BN-02-40 BOOSTER FUEL PRE-VALVE | COMPOSITE-FRD/DPL | 400 591214 | 13/ETR | YES NO | | |
| <p>FAILURE MODE-LEAK-EXTERNAL. FUEL LEAK NOTED AT THE MOUNTING FLANGE OF THE BOOSTER FUEL PRE-VALVE TO THE MAIN FUEL T ANK.</p> <p>SYSTEM EFFECT-NONE.</p> <p>VEHICLE EFFECT-NONE.</p> | | | | | | | |

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|--|--|--------------------------------|---------------------|--------------------------|------------|--------------------------------|
| CORRECTIVE ACTION-FUEL LEAK REPAIRED. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 90-06-040 A/B FUEL P AND D VALVE SWITCH | FAR 7-02319-1 | 270 591110 | WTR | YES NO | YES AIRESEARCH NO |
| FAILURE MODE-FAILURE TO OPERATE AT PRESCRIBED TIME- VALVE WOULD NOT ACTUATE DUE TO OVERHEATED MOTOR. CONDITION WAS CAUSED BY THE CLOSED SWITCH ACTUATING SCREW BEING JAMMED AGAINST THE SWITCH CASE RESULTING IN THE VALVE STOPPING BEFORE POWER CUTOFF. CONTINUED POWER APPLICATION OVERHEATED MOTOR. | | | | | | |
| CORRECTIVE ACTION-VEHICLE RE-DESIGNED BUTTERFLY SEAL TO REDUCE TORQUE AND FUTURE GEAR TRAINS WILL BE LUBRICATED TO REDUCE TORQUE. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | D434/B1-48M-06-08 VERNIER FUEL TANK ACTUATOR SEAL | COMPOSITE-FRD/DPL 390718 | 60 390718 | A-2/MTR | YES NO | YES ROCKETDYNE NO |
| FAILURE MODE-INTERNAL LEAK-VERNIER FUEL TANK PRESSURE ACTUATOR VALVE SEAL FAILED DURING COUNTDOWN. | | | | | | |
| SYSTEM EFFECT-DEPLETION OF GAS SUPPLY-DUE TO LOSS OF HELIUM FROM AMBIENT BOTTLE. | | | | | | |
| VEHICLE EFFECT-COUNTDOWN WAS ABORTED AND RESCHEDULED. | | | | | | |
| CORRECTIVE ACTION-UNKNOWN | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | FTAS028/72-304-00-08 PREVALVE ACTUATOR | COUNTDOWN | 9C 390718 | 12/ETR MINUS 54 00 | NO NO | NO NO |
| FAILURE MODE-LEAK EXTERNAL. INVESTIGATION WAS MADE AT THE FUEL PREVALVE ACTUATOR SHAFT TO VERIFY THAT A LEAK DISCOVERED PRIOR TO THE TEST HAD BEEN STOPPED. NO LEAKAGE WAS FOUND. | | | | | | |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 30 MINUTES HOLD. | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 86-06-029 FUEL DUCT, SUBSTAINER LOW PRESSURE | FAR 7-22232-3 | 20 390619 | BYCAMORE | YES NO | YES CONVAIR NO |
| FAILURE MODE-STRUCTURAL- DUCT CRACKED IN A FLEXIBLE BELLOW SECTION CONTAINING 16 CONVOLUTIONS. MATERIAL IN FAILED AREA WAS APPROXIMATELY ONE HALF NORMAL THICKNESS. | | | | | | |
| CORRECTIVE ACTION-NONE. IN VIEW OF SATISFACTORY EXPERIENCE ON B AND C MISSILES AND AN INCORPORATION OF AN IMPROVED BELLOW ON D MISSILES. | | | | | | |

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| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE | TIME DIP | DATE DIP | PRI OTM | VENDOR NAME VENDOR PART NO |
|---|---|--------------------------------|-----------------|-------------|-------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B FUEL FEED | 98-06-032 GASKET, A/B FUEL F AND D VALVE TO FUEL DUCT | FAR 7-06397 | 590606 | ETR | | YES NO | CONVAIR NO 1386-52897 |
| FAILURE MODE-INTERNAL LEAK. GASKET LEAKED FUEL DUE TO IMPROPERLY SPACED FLANGE BOLT HOLES. | | | | | | | |
| CORRECTIVE ACTION-ALL SUCH GASKETS REINSPECTED AND USE OF A POSITIONING JIG FOR PUNCHING HOLES IN GASKETS INITIATED | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 98-06-032 FILL AND DRAIN VALVE GASKET | FAR 7-23237-45 | 590606 | ETR | | YES NO | CONVAIR |
| FAILURE MODE-INTERNAL LEAK-GASKET LEAKED FUEL DUE TO IMPROPERLY SPACED FLANGE BOLT HOLES ON AIRBORNE PORTION OF FILL AND DRAIN VALVE. | | | | | | | |
| CORRECTIVE ACTION-ALL SUCH GASKETS REINSPECTED, AND USE OF A POSITIONING JIG FOR PUNCHING HOLES IN GASKETS INITIATED | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | AZC-27-051/P3-404-00-03 FUEL STAGING VALVE | FLIGHT 7-23237-45 | 590606 | 13/ETR | YES NO | | |
| FAILURE MODE-FAIL DURING OPERATION. A FUEL LEAK WHICH COMMENCED AT BOOSTER SECTION JETTISON CAUSED BY A FAILURE OF EITHER THE FUEL DUCT FLANGE, THE FUEL STAGING DISCONNECT VALVE, THE BELLOW, OR THE WELD AT THE FLANGE BETWEEN THE P RE-VALVE AND THE FUEL STAGING DISCONNECT VALVE. | | | | | | | |
| SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. | | | | | | | |
| VEHICLE EFFECT-LOSS OF VEHICLE INTEGRITY. DECREASED FUEL TANK PRESSURE, SUBSEQUENT INTERMEDIATE BULKHEAD REVERSAL/A NO MISSILE EXPLOSION AT 159.34 SECONDS. | | | | | | | |
| CORRECTIVE ACTION-SINCE THE EXACT CAUSE OF FAILURE WAS NOT DETERMINED EXTENSIVE MODIFICATIONS WERE ACCOMPLISHED ON THE FUEL STAGING VALVE, THE FUEL OUTLET FLANGE, THE BOOSTER SEPARATION SYSTEM, THE JETTISON TRACK TUBE ASSEMBLY, AND THE LAUNCHER. SPECIAL INSTRUMENTATION WAS ALSO ADDED TO SUBSEQUENT MISSILES TO ANALYZE THE CHARACTERISTICS OF THE 8 TAGING VALVE. FOR DETAILED ACCOUNT SEE FAILURE INVESTIGATION REPORT AZC-27-071. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 98-06-021 BOOSTER FUEL STAGING DISCONNECT/BO OSTER HALF | FAR 7-02229-3 | 590506 | ETR | | YES NO | REACTION MOTOR |
| FAILURE MODE-LEAK. EXTERNAL. ALL PARTS FAILED IN SAME MODE. ALL FAILURES CONSISTED OF A CRACK IN ONE OF THE APT FIV E CONVOLUTIONS OF THE BELLOW, AND OCCURRED AFTER 3 TO 7 FUEL TANKING OPERATIONS. | | | | | | | |

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| SYS- SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | 3ITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO |
|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-ABOVE PART REPLACED BY A REDESIGNED PART, P/N 27-21136-1. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 98-06-027 BOOSTER FUEL STAGING DISCONNECT -A PT SECTION- | FAR 7-02229-3 | 7C 980502 | ETR | YES NO | YES REACTION MOTOR NO 9 |
| FAILURE MODE-LEAK. BELLOW SECTION WAS LEAKING FUEL FROM A CRACK IN THE NINTH CONVOLUTION FROM THE APT END. FAILURE OCCURRED AFTER FOUR FUEL TANKING OPERATIONS AND REACHING STAGE THREE PRESSURE THREE TIMES. METAL FAILURE WAS A TENS ION TYPE FAILURE. | | | | | | |
| CORRECTIVE ACTION-7-02229-3 REPLACED BY 27-21136. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 98-06-027 BOOSTER STAGING DISCONNECT | FAR 7-02229-3 | 7C 980502 | ETR | YES NO | YES REACTION MOTOR NO 9 |
| FAILURE MODE-EXTERNAL LEAK - BELLOW SECTION WAS LEAKING FUEL FROM A CRACK IN THE NINTH CONVOLUTION FROM THE APT EN D. FAILURE OCCURRED AFTER FOUR FUEL TANKING OPERATIONS AND REACHING STAGE THREE PRESSURE THREE TIMES. METAL FAILURE WAS A TENSION TYPE FAILURE. | | | | | | |
| CORRECTIVE ACTION-7-02229-3 REPLACED BY 27-21136. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 9A-06-023 FUEL PRE-VALVE, BOOSTER | FAR 7-02229-15 | 9C 980223 | EAFB | YES NO | YES B.H.HADLEY NO |
| FAILURE MODE-FAILURE TO OPERATE AT PRESCRIBED TIME- VALVE COULD NOT BE MOVED FROM OPEN TO CLOSED POSITION. TESTS IN DICATED THAT WITH THE FOUR WAY SELECTOR VALVE VENTED TO ATMOSPHERE, (RATHER THAN TO THE NORMAL 5 PSIG PURGE BOX PRES SURE), VALVE ACTUATOR PRESSURE BUILDUP TIME TO 100 PSIG, WAS REDUCED FROM 1.6 TO 0.1 SECONDS. | | | | | | |
| CORRECTIVE ACTION-VENTING OF FOUR WAY VALVE, P/N 7-02229, TO ATMOSPHERE ACCOMPLISHED AT EAFB/MSTB, AMR NOT AFFECTED SINCE PURGE BOXES ARE VENTED BY VIRTUE OF COVER DISTORTION. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | 9A-06-023 FUEL PRE-VALVE, SUSTAINER | FAR 7-02229-15 | 9C 980223 | EDWARD8 | YES NO | YES B.H.HADLEY NO |
| FAILURE MODE-FAILURE TO OPERATE AT PRESCRIBED TIME- VALVE COULD NOT BE MOVED FROM OPEN TO CLOSED POSITION. TESTS IN DICATED THAT WITH THE FOUR WAY SELECTOR VALVE VENTED TO ATMOSPHERE, (RATHER THAN TO NORMAL 5 PSIG PURGE BOX PRESSURE), VALVE ACTUATOR PRESSURE BUILDUP TIME TO 100 PSIG WAS REDUCED FROM 1.6 TO 0.1 SECONDS. | | | | | | |
| CORRECTIVE ACTION-VENTING OF THE FOUR WAY VALVE, P/N 7-02229, TO ATMOSPHERE ACCOMPLISHED AT EAFB/MSTB, AMR NOT APPE | | | | | | |

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| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO | |
|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CTED SINCE PURGE BOXES ARE VENTED BY VIRTUE OF COVER DISTORTION. | | | | | | | 899703 |
| PROPULSION INTERFACE-A/B FUEL FEED | ZC-7-219/P2-301-00-03 FUEL DISCONNECT VALVE | FLIGHT | 5C 590220 | 12/ETR 152.8 | YES NO | | 894283 |
| FAILURE MODE-LEAK-EXTERNAL. THE FUEL DISCONNECT VALVE MALFUNCTIONED AT STAGING. | | | | | | | |
| SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. THE FAILURE OF THE VALVE CAUSED A RAPID FUEL LEAK. | | | | | | | |
| VEHICLE EFFECT-LOSS OF VEHICLE INTEGRITY. THE FUEL LEAK CAUSED FUEL TANK PRESSURE LOSS AND BULKHEAD REVERSAL AT APP ROXIMATELY 168.2 SECONDS. FOLLOWED BY SELF DESTRUCTION OF THE VEHICLE. | | | | | | | |
| CORRECTIVE ACTION-THE VALVE WAS REDESIGNED AS FOLLOWS. 1) LARGE VENT HOLES WERE CUT IN THE POPPET FAIRING. 2) LOW F RITION BEARINGS, A HARDKOTED SPRING TUBE, AND A CENTRAL CONTACT POINT BETWEEN POPPET AND PUSHER WERE ADDED. 3) MAJO R WELDS WERE CAREFULLY CONTROLLED. 4) FRICTION REDUCED BETWEEN MATING SURFACES. 5) FUEL OUTLET FLANGE REINFORCED. 6) MIDRIFF BOLTS IN POPPET SECTION DOUBLED IN NUMBER AND/OR STRENGTHENED. 7) NEW ATT HALF OF FUEL STAGING VALVE INSTALL ED. 8) TWO FAIL SAFE BOLTS PER FITTING ADDED TO BOOSTER SEPARATION FITTING. 9) PROCEDURE CHANGED. TO INCLUDE TORQUIN G CHECKS, ALIGNMENT PROCEDURE, AND INSPECTION PROCEDURES. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | FTA2542/P4-101-00-13 BOSS-INSTRUMENTATION | FMF | 13A 58-0131 | 14/ETR 152.8 | YES NO | | 899331 |
| FAILURE MODE-LEAK-EXTERNAL. FUEL LEAKAGE AT PIN HOLE IN A WELD ON AN INSTRUMENTATION BOSS IN THE W2 FUEL INLET DUCT ING. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-COUNTDOWN DELAYED. TOTAL HOLD TIME WAS FOUR HOURS TO INVESTIGATE THIS LEAK AND SEVERAL OTHER LEAKS. | | | | | | | |
| CORRECTIVE ACTION-NONE. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | FTA4516/P2-302-00-3 FUEL FUEL Y DUCT BELLOW | COUNTDOWN | 3C 581223 | 12/ETR 152.8 | YES NO | | 899587 |
| FAILURE MODE-LEAK (EXTERNAL). A FUEL LEAK WAS FOUND IN BELLOW ON TOP OF Y DUCT AT RHL VALVE. THIS PROBLEM OCCURRED DURING X-1 DAY FUEL TANKING OPERATION. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-DETANKED FUEL, APPARENTLY CORRECTED LEAK, AND RETANKED FUEL ON X DAY. | | | | | | | |

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|--|--|--------------------------------|--------------------------|-----------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B FUEL FEED | ZC-7-210/P4-28N-02-12 BULKHEAD FITTING | COMPOSITE-B FACT | 120 301117 | 14/ETR | YES NO | 093039 |
| FAILURE MODE-EXTERNAL LEAK. DURING FUEL TANKING, THE BULKHEAD FITTING LEADING INTO THE VERNIER BLEED ORIFICE BLOCK WAS FOUND TO BE TOO LONG. | | | | | | |
| SYSTEM EFFECT-NONE. THE EXCESS LENGTH OF THE BULKHEAD FITTING PREVENTED THE O-RING FROM SEATING RESULTING IN A FUEL LEAK. | | | | | | |
| VEHICLE EFFECT-NONE. THE FLIGHT ACCEPTANCE TEST (TEST NO. P4-28N-03-12) WAS SUCCESSFULLY RUN ON 10 NOVEMBER 1959. | | | | | | |
| CORRECTIVE ACTION-THE FITTING WAS SHORTENED TO CORRECT THE LEAK. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | EM-1026/ TEST 14-303-A2 FUEL PRE-VALVE SOLENOID, CONTROL C IRCUITY | CAPTIVE | 300808 | 1-4/EDWA RDS 34 | YES NO | 093007 |
| FAILURE MODE-ERRATIC OPERATION. DEACTIVATION OF SUSTAINER FUEL PRE VALVE OPEN MICROSWITCH AT 34 SECONDS. POST TEST INVESTIGATION REVEALED THAT AN INTERMITTENT OUTPUT TO THE SUSTAINER PRE VALVE SOLENOID FROM THE 28V CONTROL CIRCUIT CAUSED THE CLOSING SIDE TO PRESSURIZE. A CLOSING CONTROL PRESSURE OF 360 PSIG IS NECESSARY TO OVERRIDE THE MECHANICAL LOCK UNDER STATIC CONDITIONS. | | | | | | |
| SYSTEM EFFECT-OPERATION STOPS TOO EARLY. | | | | | | |
| VEHICLE EFFECT-PREATURE PROPULSION SHUTDOWN. TEST WAS SCHEDULED FOR 40 SECONDS OF BOOSTER OPERATION, 100 SECONDS OF SUSTAINER OPERATION AND 103 SECONDS OF VERNIER OPERATION. ACTUAL OPERATION WAS 34 SECONDS. | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | PTA3044/PE-103-00-10 FITTING-FLARE | COUNTDOWN | 16A 300320 | 12/ETR -22 | YES NO | 097977 |
| FAILURE MODE-LEAK-EXTERNAL. A LEAK DEVELOPED IN A FLARE FITTING IN THE V1 FUEL LINE UPSTREAM OF THE PROPELLANT VALVE. THE LEAK OCCURRED AT START TANKS PRESSURIZING. | | | | | | |
| SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. THE LEAK DEPLETED THE VERNIER FUEL START TANK BEFORE IGNITION. | | | | | | |
| VEHICLE EFFECT-COUNTDOWN ABORTED. V1 DID NOT IGNITE, V2 AND THE APS SHUTDOWN EARLY DUE TO FUEL DEPLETION. | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | PTA2942/P4-101-00-13 BOSS-INSTRUMENTATION, SEAL | FRP | 13A 300131 | 14/ETR | YES NO | |
| FAILURE MODE-LEAK-EXTERNAL. FUEL LEAKAGE AT TWO 91 FUEL DUCT INSTRUMENTATION BOSS TORQUEAL FITTINGS. | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO | |
|---|--|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| SYSTEM EFFECT-NONE. | | | | | | | 893333 |
| VEHICLE EFFECT-COUNTDOWN DELAYED. TOTAL HOLD TIME WAS FOUR HOURS TO FIX THESE LEAKS AND SEVERAL OTHERS. | | | | | | | |
| CORRECTIVE ACTION-ONE FITTING TIGHTENED UP SATISFACTORILY. THE OTHER BOSS TOROSEAL WAS REPLACED. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | FTA2542/P4-101-00-13 BOSS-INSTRUMENTATION, SEAL | PRF | 13A 580131 | 14/ETR | YES NO | | 893332 |
| FAILURE MODE-LEAK-EXTERNAL. FUEL LEAKAGE AT TWO BE FUEL DUCT INSTRUMENTATION BOSS TOROSEAL FITTINGS. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-COUNTDOWN DELAYED. TOTAL HOLD TIME WAS FOUR HOURS TO FIX THESE LEAKS AND SEVERAL OTHER LEAKS. | | | | | | | |
| CORRECTIVE ACTION-ONE FITTING TIGHTENED AND ONE TOROSEAL FITTING REPLACED. BOTH STILL SHOWED SOME SLIGHT SEEPAGE BUT THE MISSILE WAS COMMITTED TO PRF IN THIS CONDITION. LEAKS DID NOT INCREASE IN MAGNITUDE DURING FIRING. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | EN-7511-1-111-SP4-03 VIFUELSENSING LINE, B-NUT | CAPTIVE | 5A 571017 | 1-1/EDWA RDS | YES NO | | 893285 |
| FAILURE MODE-LEAK-EXTERNAL-LOOSE V1 FUEL INLET SENSING LINE B-NUT. | | | | | | | |
| SYSTEM EFFECT-NONE. THE LOOSE B-NUT CAUSED A LEAK IN VICINITY OF VERNIER ENGINE NO.1. | | | | | | | |
| VEHICLE EFFECT-COUNTDOWN DELAYED. | | | | | | | |
| CORRECTIVE ACTION-A HOLD WAS CALLED AND B-NUT WAS TIGHTENED. QUALITY CONTROL WAS INSTRUCTED TO TIGHTEN UP INSPECTION REQUIREMENTS. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | FTA21261/P4-101-00-08 PREVALVE SHV/FT SEAL | PRF | 6A 570920 | 14/ETR | YES NO | | 891808 |
| FAILURE MODE-INTERNAL LEAK. POST TEST INVESTIGATION REVEALED A LEAKING SHAFT SEAL ON THE FUEL PREVALVE. | | | | | | | |
| SYSTEM EFFECT-NONE. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | FTA2126/P4-101-07-08 FLANGE SEAL | COUNTDOWN | 6A 570920 | 14/ETR -10660 | YES NO | | |
| FAILURE MODE-EXTERNAL LEAK. A LEAK AT THE B1 FUEL PUMP INLET FLANGE. FLANGE BOLTS WERE TIGHTENED AND THE LEAK WAS REDUCED TO AN ACCEPTABLE LEVEL. | | | | | | | |

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CONVAIR DIVISION

13 JUN 1966

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIP DATA SOURCE PART NUMBER | VEHICLE DATE DIP | SITE TIME DIP | PRI OTH | VENDOR NAME VENDOR PART NO | |
|--|--|--------------------------------|---------------------|-----------------------|------------|-------------------------------|--------|
| SYSTEM EFFECT-NONE. | | | | | | | 001023 |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 289 MINUTES OF HOLD FOR THIS AND OTHER LEAKS. | | | | | | | |
| CORRECTIVE ACTION-TIGHTEN FLANGE BOLTS. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | ATPI-1.1A3 FUEL FILL AND DRAIN VALVE | CAPTIVE | 5A 970809 | 1-1/EDWA RDS | YES NO | | 009054 |
| FAILURE MODE-LEAK-DURING AN ATTEMPT TO TANK FUEL AT A FLOW RATE OF 300 GPM THE FUEL FILL AND DRAIN VALVE SEPARATED BY ONE-FOURTH TO ONE-HALF INCHES. | | | | | | | |
| SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY-THIS SEPARATION CAUSED A LEAK AND FUEL SPRAYED OVER THE ENGINES AND TEST STAND. | | | | | | | |
| VEHICLE EFFECT-COUNTDOWN DELAYED. | | | | | | | |
| CORRECTIVE ACTION-TANKING RATE WAS DECREASED FROM 300 GPM TO 250 GPM. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | EN-557/1A.106-D4-02 BITURBINEINLETDUCT,PLUG | CAPTIVE | 2A 970726 | 1A/EDWAR DS 9-1 | YES YES | | 007243 |
| FAILURE MODE-LEAK EXTERNAL. A ONE-QUARTER INCH PLUG WAS MISSING FROM B-1 TURBINE INLET DUCT INSTRUMENTATION BOSS PERMITTING GAS GENERATOR EXHAUST GAS TO BLOW INTO THE THRUST SECTION. | | | | | | | |
| SYSTEM EFFECT-LOSS OF STRUCTURAL INTEGRITY CREATING A FUEL RICH EXPLOSION ATMOSPHERE RESULTING IN SUBSEQUENT EXPLOSION 0.15 SEC AFTER CUTOFF. MINOR DAMAGE TO THRUST SECTION. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | EN-557/1A.106-D4-002 BIFUELPUMPINLETDUCT,DUCT | CAPTIVE | 2A 970726 | 1A/EDWAR DS 9-1 | YES YES | | 007244 |
| FAILURE MODE-LEAK EXTERNAL. FUEL LEAK IN A PLUG IN THE B1 FUEL PUMP INLET DUCT DURING MAINSTAGE COMBUSTION. POST-TEST CHECKS INDICATED FUEL LEAKAGE AT PLUG WITH DUCT PRESURIZED TO 6 PSI. | | | | | | | |
| SYSTEM EFFECT-LOSS OF STRUCTURAL INTEGRITY CREATING A FUEL RICH EXPLOSION ATMOSPHERE AND SUBSEQUENT EXPLOSION 0.15 SEC AFTER CUTOFF. MINOR DAMAGE TO THRUST SECTION. | | | | | | | |
| VEHICLE EFFECT-NONE. | | | | | | | |
| CORRECTIVE ACTION-UNKNOWN. | | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REVIEW-PROBATION INTERFACE SYSTEM-AIRBORNE

| SYSTEM S/B-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO |
|--|---|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPULSION INTERFACE-A/B FUEL FEED | EM-3571-A-103-04-02 BOOSTER FUEL PUMP INLET MANIFOLD | CAPTIVE | 2A 370723 | 1A/EDWAR DS | NO | |
| <p>FAILURE MODE-STRUCTURAL-THE BOOSTER FUEL PUMP INLET MANIFOLD COLLAPSED SLIGHTLY DUE TO AN OPERATIONAL ERROR. THE OPERATOR MANUALLY CLOSED THE FUEL PRE-VALVE. DURING THE START SEQUENCE, THIS RESULTED IN RAPID FUEL DEPLETION AND PRESSURE DECAY AT THE PUMP INLET AND SUBSEQUENT BOOSTER ENGINE SHUTDOWN.</p> <p>SYSTEM EFFECT-OPERATION STOP PREMATURELY.</p> <p>VEHICLE EFFECT-PREMATURE BOOSTER ENGINE SHUTDOWN.</p> <p>CORRECTIVE ACTION-THE MANIFOLD WAS REPLACED.</p> | | | | | | |
| PROPULSION INTERFACE-A/B FUEL FEED | ZC-7-038/14.102-23 B1 FUEL PUMP FEED DUCT | CAPTIVE | 540820 | 1-4/EDWA RDS | YES | |
| <p>FAILURE MODE-STRUCTURAL. POST TEST INSPECTION REVEALED THAT THE B1 FUEL INLET DUCT COLLAPSED DURING TEST AS A RESULT OF CLOSED PRE VALVES. THIS WAS A LOW WATER BLOW DOWN TEST.</p> <p>SYSTEM EFFECT-LOSS OF STRUCTURAL INTEGRITY.</p> <p>VEHICLE EFFECT-PREMATURE PROPULSION CUTOFF.</p> <p>CORRECTIVE ACTION-REPLACE DUCT.</p> | | | | | | |
| PROPULSION INTERFACE-A/B GENERAL | ETR-018/18-511-11-3E B1 LOW PRESSURE FUEL DUCT | CAPTIVE | 800603 | 1-4/EDWA RDS | YES NO | |
| <p>FAILURE MODE-EXTERNAL LEAK WAS DISCOVERED AT A STIFFER SPOT WELD IN THE DUCT DURING POST TEST INSPECTION.</p> <p>SYSTEM EFFECT-NONE.</p> <p>VEHICLE EFFECT-NONE.</p> <p>CORRECTIVE ACTION-UNKNOWN.</p> | | | | | | |
| PROPULSION INTERFACE-A/B GENERAL | S-1804/31-403-AE-38 VALVES-PRE-BOOSTER AND SUSTAINER | CAPTIVE | 340 391103 | BYC | NO NO | |
| <p>FAILURE MODE-FAIL TO CEASE OPERATION AT PRESCRIBED TIME. SUSTAINER AND BOOSTER FUEL PRE-VALVES DID NOT CLOSE FOLLOWING CUTOFF. POST TEST INVESTIGATION REVEALED A FAULTY FUEL PRE-VALVE CLOSING CONTROL SOLENOID VALVE IN THE SSB.</p> <p>SYSTEM EFFECT-OPERATION TOO LONG.</p> <p>VEHICLE EFFECT-NONE. TEST COMPLETED PRIOR TO DIFFICULTY.</p> | | | | | | |

GENERAL DYNAMICS
CONVAIR DIVISION

DIFFICULTIES REVIEW-PROPUSSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | DIF DATA SOURCE PART NUMBER | VEHICLE DATE DIF | SITE TIME DIF | PRI OTH | VENDOR NAME VENDOR PART NO |
|--|--|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-SOLENOID REPLACED. | | | | | | |
| PROPULSION INTERFACE-A/B GENERAL | B6-08-025 CANONCONNECTOR, BOOSTER ENGINE CONTR OL INSULATION | FAR 673108E-28-155 | 2D 590520 | SYCAMORE | YES NO | YES NO |
| FAILURE MODE-ELECTRICAL OPEN. THREE OPEN CIRCUITS INDICATED DURING TESTS. CAUSE OF FAILURE WAS INSUFFICIENT POTTING TWISTED CABLE, NO INSULATION SLEEVES OVER SOLDERED CONNECTIONS, THREE BROKEN WIRES AND CORROSION. | | | | | | |
| CORRECTIVE ACTION-NEW POTTING PROCEDURE INITIATED APPROXIMATELY 9/19/99. | | | | | | |
| PROPULSION INTERFACE-A/B GENERAL | ZB-7-066-3A/104 START TANK, SOLENOID | CAPTIVE | 3A 870310 | 8-1/8YC -15 | YES NO | YES NO |
| FAILURE MODE-OUT OF TOLERANCE. | | | | | | |
| SYSTEM EFFECT-OPERATION TOO LOW. | | | | | | |
| VEHICLE EFFECT-COUNTDOWN, COMPOSITE ABORTED AND RESCHEDULED. | | | | | | |
| CORRECTIVE ACTION-START TANKS PRESSURIZING SOLENOID REPLACED, EXTERNAL HEATING UNIT MODIFIED TO ALLOW REACTIVATION AFTER SHUTOFF. | | | | | | |

GENERAL DYNAMICS
COMVAIR DIVISION

19 JUN 1966

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-AIRBORNE

| SYSTEM SUB-SYSTEM | TEST/REPORT NUMBER FAILED COMPONENT NAME | BIP DATA COURSE PART NUMBER | VEHICLE DATE BIP | SITE TIME BIP | PRI OTH | VENDOR NAME VENDOR PART NO |
|----------------------|---|--------------------------------|---------------------|------------------|------------|-------------------------------|
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